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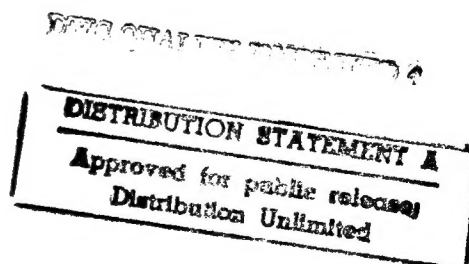
China Report

SCIENCE AND TECHNOLOGY

CHINESE ACADEMY OF SCIENCES

1985 DIRECTORY

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9 SEPTEMBER 1986

CHINA REPORT
SCIENCE AND TECHNOLOGY
CHINESE ACADEMY OF SCIENCES
1985 DIRECTORY

Beijing ZHONGGUO KEXUEYUAN [CHINESE ACADEMY OF SCIENCES] in Chinese
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[Text] Preface

The Chinese Academy of Sciences is a comprehensive research center for the nation's natural sciences. Guided by the policy of "economic construction must rely on science and technology, and science and technology must rely on natural science," the broad masses of scientific and technical personnel are making great strides toward quickly achieving numerous results and rapidly training talented personnel.

CAS was founded on 1 November 1949 on the basis of the Central Academy of Sciences and the Beiping Academy of Sciences. At the time, CAS included social science institutions, operated only 21 research institutes, and had only 200 or so researchers. In 35 years, the operating scale of CAS has grown tremendously, and social science research work has been channeled into a separate Chinese Academy of Social Sciences. By 1984, CAS had 118 research institutions, 43,939 scientific and technical personnel, of which there were 3,241 high-level scientific researchers above the level of assistant professor. There are about 4,000 scientific research topics a year, and these have provided numerous scientific research results for the national economy and for national defense.

In 1956, when China drew up its first long-range program for the development of science and technology (i.e., the 12-Year Program for 1956 to 1967), CAS established new research institutions in the fields of semiconductors, computing technology, automation, electronics, etc., thus taking the lead in developing emerging branches of science and technology and continually upgrading the level of scientific research. A second long-range plan was drawn up in 1962 (i.e., the 10-Year Program for 1963 to 1972). By 1965, the number of CAS research organizations had grown to 106, and the number of research workers and technical personnel exceeded 22,000. In basic sciences and a few new technical fields, the gap between China and advanced international levels narrowed, and in some areas, China was close to or surpassed the advanced international levels at the time.

During the 10 years of chaos brought on by the "Cultural Revolution," the CAS was greatly impaired and damaged, thus opening a gap between China's scientific research level and international levels.

After the smashing of the "gang of four," especially after the 3d Plenum of the 11th CPC Central Committee, a spring of science emerged. China formulated its third science and technology development plan (i.e., the 8-Year Program for 1978 to 1985), and once again CAS showed signs of vigorous growth. It was decided that the major tasks were to study and develop the new theories and new technologies of the natural sciences, to restore the vitality of the institutes, and to replenish the members of the institutes. CAS established five divisions and a section, namely, Division of Mathematics and Physics, Division of Chemistry, Division of Biological Sciences, Division of Earth Sciences, Division of Technological Sciences, and a Management Science Section, and it also has a number of special committees. CAS also established branch academies in 12 areas in which subordinate organizations

were fairly concentrated, namely, Shanghai, Nanjing, Wuhan, Hefei, Xinjiang, Lanzhou, Chengdu, Kunming, Guangzhou, Changchun, Shenyang, and Xi'an.

Currently, based on the needs of economic construction in this new period, scientists and the entire body of workers of the CAS, in the spirit of making great efforts to strengthen applied research, actively and selectively participating in development work, and continuing to pay attention to basic research, have studied advanced experience from home and abroad, and have worked hard for the vigorous development of the nation.

Members of the Presidium of the Chinese Academy of Sciences

Executive chairmen: Yan Jici [0917 3444 1964], Wu Zonghua [0702 0112 5478], Lu Jiaxi [4151 0857 6932], Qian Xuesen [6929 1331 2773], and Wu Heng [2967 5899]

Members of the Presidium (in order of strokes in their Chinese surnames): Yu Guangyuan [0060 0342 6678], Wang Daheng [3769 1129 3801], Wan Ganchang [3769 3227 2490], Ye Duzheng [0673 4648 2973], Feng Depei [7458 1795 1014], Lu Jiaxi [4151 0857 6932], Hua Luogeng [5478 5012 1649] (deceased), Song Ping [1345 1627], Yan Dongsheng [0917 2639 3932], Yan Jici [0917 3444 1964], Li Chang [2621 2490], Wu Zhonghua [0702 0112 5478], Wu Zhengyi [0702 1767 6965], Wu Heng [2967 5899], Yu Wen [6735 2429], Zhou Peiyuan [0719 1014 3293], Zhang Wenyou [1728 2429 0147] (deceased), Zhang Guangdou [1728 0342 2435], Hu Keshi [5170 0344 1395], Hou Xianglin [0186 4382 7792], Qin Lisheng [4440 0500 3932], Qian Sanqiang [6929 0005 1730], Qian Xuesen [6929 1331 2773], Tu Guangchi [3205 0342 3589], Gao Yi [7559 3085], Tang Aoqing [0718 2407 1987], Xie Xide [6200 1585 1795]

Organizational Structure of the Chinese Academy of Sciences

General Office

Deputy director (and acting director): Luan Zhongxin [2940 0022 1800]
Deputy directors: Ge Nengquan [5514 5174 0356], Li Yunling [2621 0061 3781]

Planning Bureau

Director: Zhang Yungang [0791 0061 1511]
Deputy directors: Lin Wendeng [2651 2429 3397], Bai Weimin [4101 0251 3046]

Division of Math and Physics

Director: Zhang Zong [4545 4844]
Deputy directors: Ma Dayou [7456 1129 3731], Wu Wenjun [0702 2429 0193], Wang Shouguan [3769 1129 3731], Xue Shiyong [5641 1102 9469]

Division of Chemistry

Director: Yan Dongsheng [0917 2639 3932]
Deputy directors: Zhang Qinglian [0719 7230 5571], Chen Guangcai [7115 0385 2837], Huang Yaozeng [7806 5069 2582], Qian Wenzao [2629 2429 5679]

Division of Biological Sciences

Director: Cao Tianyin [2580 1131 7390]
Deputy directors: Zhang Zhiyi [0719 5268 0001], Xu Guanren [1776 0385 0088], Song Zhenheng [1345 2182 5174], Xue Pangao [5641 2372 4108]

Division of Earth Sciences

Director: Tu Guangchi [3205 0342 3589]

Deputy directors: Cheng Yuqi [4453 5940 3217], Ye Lianjun [0673 6647 0193],
Shi Yafeng [2457 7161 7364], Sun Yuliao [1327 3768 4430], Zhang Tao [0719 3614]

First Division of Technical Sciences

Director: Shi Changxu [1597 2490 4872]

Deputy directors: Chen Laochong [7115 0525 0339], Liu Xiangshen [0491 5046
5116], Lao Xuezhi [5685 1331 2535]

Second Division of Technical Sciences

Director: Wang Daheng [3769 3227 2490]

Deputy director: Zhang Guangdou [0719 0342 2453]

Bureau of Scientific and Technical Contracts

Director: Zhu Xuan [4555 3763]

Deputy directors: Yang Shang [2799 3932], Huang Tieshan [7806 6933 3790]

Bureau of Scientific Capital Construction Funds

Director: Huang Jian [7806 1017]

Deputy director: Pan Zhenji [3382 2182 1015]

Bureau of New Technological Developments

Director: Zhu Lingshan [2612 3830 3790]

Deputy director: Zhong Qi [6988 3825]

Office of Policy Research

Director: Luo Wei [5012 0251]

Bureau of Technical Conditions

Director: Li Yuhai [2621 3768 3189]

Deputy director: Wang Yongle [3769 3057 2867]

Bureau of International Cooperation

Director: Yuan Chengyu [5913 2110 1946]

Deputy directors: Cai Taishan [1508 3141 1472], Zhang Linyu [0719 3932 3768]

Education Bureau

Director: He Long [0149 7893]

Deputy director: Zhang Yanling [0719 1693 7881]

Preparatory Discipline Inspection Group of Units Subordinate to the Beijing District

Deputy directors: Li Ke [0702 0344], Shi Aichun [2457 1947 2797]

Beijing District Party Committee

Secretary: Wu Xuezhen [0702 1331 3791]

Deputy secretaries: Jin Guangzu [6855 1129 4371], Hu Zhendan [5170 7201 2481]

Party Committee

Secretary: Guan Mengqi [7070 1332 6386]

Deputy secretaries: Wu Zhao [0702 2507], Guo Suzhi [6753 4790 5347]

Propaganda Department of the Beijing District Party Committee

Director: Wu Baozu [0702 0202 4371]

Deputy directors: Xu Degao [6079 1795 7559], Tang Yongen [0781 3057 1869]

United Front Department of the Beijing District Party Committee

Director: Wang Bing [3769 0393]

Deputy directors: Zhu Yongxing [2612 3057 5886], Wang Xuequn [3769 1471 5028]

Bureau of Senior Cadres and Senior Specialists

Director: Wu Jie [0702 2212]

Deputy directors: Shi Fengqi [0670 7685 1477], Ren Bianling [0117 0593 3830]

Cadre Bureau

Director: Gu Yuancheng [7357 6678 4453]

Deputy directors: Zhang Zhilin [0719 1807 2651], Shi Tingjun [5258 1656 0193]

Security Bureau

Director: He Yuanguang [0149 6678 0342]

Deputy directors: Xi Guang [3588 0342], Liu Xiaozhong [0491 2556 0022]

Bureau of Management and Administration

Director: Liu Benen [0491 2609 1896]

Capital Construction Bureau

Director: Wang Yousan [3076 0645 0005]

Deputy directors: Xue Zhonglin [5641 4429 7227], He Raoxi [0149 0131 3556]

Academic Secretary Office of the Presidium

Director: Li Jishi [2621 0679 1102]

Eastern Scientific Instruments Import/Export Corporation

Manager: Qu Shouci [2575 1343 1964]

Science Newspaper Office

Director: Ye Duzheng [0673 4648 2973]

Deputy director and editor: Liu Shengyuan [0491 5116 6678]

Deputy editors: Wang Heshan [3769 7729 1472], Zhang Shen [0719 2619]

Agriculture Research Committee

Vice chairman: Li Songhua [2621 2646 5478]

Ecological Research Committee

Vice chairman: Guo Fang [6753 2455]

Energy Research Committee

Vice chairman: Wang Shizhong [3769 0013 0022]

Publishing and Book Information Committee

Vice chairman: Xie Shulian [6200 3219 5571]

Institute of Mathematics

The Institute of Mathematics was founded in 1952. It is a polytechnical institute in mathematics, mainly devoted to research on the fundamental theory of mathematics. At present, its main fields of interest are: 1) algebra, algebraic group, algebraic number theory; 2) number theory, analytic number theory, and Diophantine analysis; 3) theory of functions, functions of a complex variable, several complex variables, real variables; 4) functional analysis, operator algebra, linear operator, nonlinear functional analysis; 5) topology, algebraic topology, singularity theory, differential topology; 6) differential geometry, and algebraic geometry; 7) differential equations, partial differential equations, ordinary differential equations; 8) numerical analysis, spline functions, numerical solution of differential equations; 9) computer sciences; theoretical computer sciences, artificial intelligence, applied software, software engineering, data bases; and 10) mathematical history.

The Institute of Mathematics also engages in research on the overlapping fields associated with the aforementioned fields and their applications. Since its founding, because of the development of scientific endeavors, the Institute of Mathematics has supported the establishment of the Institute of Computing Technology, the Institute of Mechanics, the Computing Center, the Institute of Applied Mathematics, the Institute of Systems Science, and other research units. These institutions have been developing while the Institute of Mathematics continues to maintain its vitality.

Honorary director: Hua Luogeng [5478 5012 1649] [deceased]

Director: Wang Yuan [3769 0337]

Party secretary: Wu Yun [0702 0061]

Academic Committee chairman: Wang Yuan

Address: Zhongguancun, Beijing

Telephone: 281620

Institute of Applied Mathematics

In 1977, the applied critical path method was extended throughout China and the CAS Institute of Applied Mathematics Extension Office was established on the basis of the Optimization Team. At the end of 1979, the Extension Office and parts of the Mathematics Institute's Operations Office and Probability and Statistics Office were combined and expanded into the Institute of Applied Mathematics. Four subsidiary research offices were established: the Optimization and Managerial Sciences Office, the Differential Equation and Calculation Physics Office, the Operations Office, and the Probability and Statistics Office. They now have 130 employees including 105 scientific research personnel, 6 full researchers (grade), 20 associate researchers, and 37 assistant researchers (grade). There are 40 graduate students enrolled in school. The Institute of Applied Mathematics is engaged in research on mathematical methods and basic theory. The main topics are the theory and application of optimization and operations, computational physics, mathematical planning and its applications, time-sequence analysis and its applications, macroeconomic modeling research and applications, theories of economic mathematics, computer science, qualitative theories of differential equations, random operations, graph theory, computer modeling and its applications in the national economy, multivariate analysis, random process theory, etc.

Important scientific research achievements since the institute was founded include the extension and application of optimization and operations methods in Sichuan, Nei Monggol, and Jiangsu, optimum oil conservation techniques and railway systems transportation operations, optimization theory and its applications, the application of large-scale computers in the realm of mathematical research, mathematical modeling and calculations methods for questions related to modern communications, applications of mathematical methods in economic analysis and planning equilibrium, mathematical blanking methods, random process linear estimation theory and applications, Martingale and random integration theory, digital modeling of tidal mixing in the Bohai Sea, research on design on curved surfaces and selection of primary parameters of plows, etc.

Honorary director: Hua Luogeng [5478 5012 1649]

Institute director: Wu Fang [0702 2455]

Party secretary: [blank]

Address of institute: No 19, Xibei Qu, Youyi Binguan [Friendship Hotel],
Beijing

Telex: 3938

Telephone: 895953 (office)

Institute of Mechanics

The Institute of Mechanics was established in 1956. Its predecessor was the Mechanics Research Office of the CAS Institute of Mathematics. It now has 800 employees including 527 S&T personnel (of which 48 are advanced researchers and 381 are middle-level researchers). It has 13 research offices and 1 machine processing plant. These 13 research offices are engaged in basic and applied research on fluid mechanics, solid mechanics, explosive mechanics, electromagnetic fluid and plasma dynamics, marine soil mechanics, mechanical properties of materials, mechanics measurement techniques, and other modern marginal disciplines.

Since its establishment, it has received more than 20 major scientific achievement awards at the national and academy level, including being one of the creators of engineering cybernetics in the world, and it opened up research on operations in China. In relation to the problem of high deflection in thin circular elastic plates, they summarized the high deflection thin plate and thin shell perturbation method created by Chinese scientists. Research on explosion shaping model laws, shaping mechanisms, and other questions has provided a theoretical and practical foundation for determining the shape of explosions and promoted the development and application of this technique in space and other departments. Fluid plasto-elasticity theory also was established at the same time as in foreign countries to describe and predict underground nuclear explosions and several important phenomena in the area of armor piercing and destruction. The question of the axial symmetry of planar stress of high plastic strain and the general results and side-view isotropic spatial questions of the mechanics of elastic bodies are all valuable results for methods of solving metal hardening regions. It has led the way in some areas of research on aerodynamics and aerothermal questions and played a role in providing basic research techniques, and to this day remains an important force in responsibility for research in this area. Obvious results also have been obtained in developing elasticity theory, plate and shell theory, and fracture mechanics and their applications.

Experimental equipment and laboratories: a shock wave wind tunnel and cannon wind tunnel; a supersonic wind tunnel; an electric arc heater and electric arc wind tunnel; a hydrodynamics laboratory; an explosion tunnel experiment system; high frequency, working frequency, and low voltage plasma generators; light air cannon (for materials dynamics experiments); fatigue, fracture, vibration, and optical laboratories; a high temperature gas laboratory; a marine soil statics and dynamics laboratory; an aerodynamic, pulse, and mobile discharge laser laboratory; an earth fluid mechanics laboratory; a mechanics measurement laboratory, etc.

Institute director: Zheng Zhemin [6774 0772 2404]

Party secretary: Han Lin [7281 2651]

Location: Zhongguancun, Beijing

Cable address: 1101

Telephone: 282152

Institute of Physics

The Institute of Physics was established in 1950 and formerly was called the Institute of Applied Physics. It was renamed the Institute of Physics in 1958.

The Institute of Physics is a comprehensive scientific research organization that is engaged in basic and applied physics research. The main fields at the time the institute was established were crystallography, optical spectroscopy (mainly applied spectroscopy), magnetism, electricity, etc. It became a multidisciplinary scientific research institute at the end of the First 5-Year Plan with a primary emphasis on solid physics.

The one-level structure of the research office was eliminated in 1984 during reforms in S&T system, and research groups serve as the basic scientific research units. There are now 57 research groups, 11 public laboratories, 1 research and development company, 1 subsidiary plant, and a liquid helium production low-temperature workshop. The primary realms of research work at the present time are: magnetism, crystallography, low-temperature physics, high-pressure physics (including high pressure technologies), noncrystalline physics, superconductivity, surface physics, solid energy spectra, plasma physics, atomic element physics and laser physics, electronics and computing technologies, etc. The laboratories include X-ray, nuclear magnetic resonance, electron microscopy, physiochemical analysis, beam current, Mossbauer spectrum, etc.

There have been more than 200 scientific research achievements since the institute was founded. The major scientific research achievements are: research on artificial and synthetic crystals (quartz, ruby, TAG, LiIO_3 , etc.), new materials (soft magnetic and hard magnetic alloys, ion oxides, magnetic films, superconducting materials, artificial and synthetic diamonds, microwave absorption materials, etc.), strengthened neutron diffraction of $\alpha\text{-LiIO}_3$ crystals in electrostatic fields, and on a number of unusual phenomena; determination of the structure of insulin; research on the electrical properties of Type II superconductors; and the establishment of low-temperature and high-pressure technologies, all of which have filled in national gaps.

Director: Guan Weiyan [7619 1919 3508]

Party secretary: Wang Yutian [3769 3768 3944]

Academic Committee chairman: Guan Weiyan (concurrent)

Address: Zhongguancun, Beijing

Telephone: 281712 (institute office)

Institute of High Energy Physics

The Institute of High Energy Physics was established in 1973. Its predecessor was the CAS Institute of Modern Physics which was founded in 1950 and later renamed as a part of the Institute of Atomic Energy.

The Institute of High Energy Physics has 14 research offices (departments) including high energy experimental physics, cosmic ray physics, theoretical physics, high energy accelerators, synchronous radiation, applications of nuclear technology, etc., as well as an experimental plant for equipment improvement. It has nearly 2,000 employees including more than 80 advanced S&T personnel at the level of associate researcher, advanced engineer and above, and more than 700 assistant researchers, engineers, and other mid-level S&T personnel.

The primary research orientation of the Institute of High Energy Physics is to use physics experiments to explore microscopic structures and laws of motion of materials at layers deeper than atomic nuclei. The focus in recent times has been on research and trial manufacture of high energy accelerator technologies and high energy physics detector technologies. The primary tasks and research work at present are: 1) to construct a 2×2.2 BeV electron-positron collider and a large-scale magnetic spectrometry physics detector; 2) to employ synchronous radiation light beams in the electron-position collider to provide the experimental conditions for applied research in solid physics, materials science, microelectronics, bioengineering, medicine, and other areas; 3) to expand the already constructed 10 MeV proton linear accelerator to one of 35 MeV, and to develop production of short-lived isotopes for medical uses and research on neutron cancer therapy; 4) research on cosmic ray physics and high energy astrophysics; 5) research on particle theory physics and high energy nuclear physics theories; 6) research on the application of nuclear technology; and 7) high energy physics experiments and international cooperation.

Over the past 30-plus years, S&T personnel of the institute discovered anti-sigma negative hyperons at the (Dubna) Joint Nuclear Institute's accelerator in the Soviet Union and established China's first proton electrostatic accelerator during the 1950's. During the 1960's, it established China's first linear electron accelerator and a large-scale magnetic cloud chamber at Yunnan's high mountain cosmic ray observation station, and theoretical workers established a straton model theory of the structure of hadrons. It completed China's first linear proton accelerator in 1982, etc. During physics experiments and the process of developing a particle accelerator and high energy physics detector, it established and developed many types of incisive sciences and technologies like ultrahigh vacuum, ultrahigh voltage, very-large power frequency and microwave technologies, large current rapid pulse technologies, rapid electronics technologies, precision magnetic field measurements, automatic control, electronic computing CAMAC interface technologies, large-scale aerological sounding balloon technologies, etc.

Honorary director: Zhang Wenyu [1728 2429 5940]

Director: Ye Minghan [0673 6900 3352]

Party secretary: He Long [0149 7893]

Science and Technology Commission chairman: Zhu Hongyuan [2612 3163 0337]

Address: No 19-B Yuquan Road, Beijing

Telephone: 81 2971 (central switchboard)

Telex: 9128

The Beijing Electron-Positron Collider

The CAS Institute of High Energy Physics is responsible for construction of the state's laboratory at the Beijing Electron-Positron Collider. Groundbreaking for construction was held in Beijing on 7 October 1984 and completion is expected in 1988. This 2 x 2.2 BeV collider is composed of an injector, a storage ring, a detector, a synchronous radiation producing region, and other parts. It will be able to carry out high energy physics experiments after completion and also can produce synchronous radiated light and carry out research work in electronics, materials, biology, physics, and other areas.

Institute of Theoretical Physics

The Institute of Theoretical Physics was founded in May 1978. It now has 27 scientific research personnel including 6 full researchers (5 academic department members), 9 associate researchers, 9 assistant researchers, and 1 experimental researcher. One person obtained a doctorate recently and one doctoral student is employed.

The institute has two research offices. The first research office is engaged in research work in areas that include particle physics and field theory, gravitational theory, theoretical astrophysics, mathematical physics, and other areas. The second research office is engaged in research work related to nonequilibrium state statistical physics, condensed state theory, computational physics, atomic and molecular physics theory, and nuclear physics theory.

The main achievements since the institute was founded are: in the area of field theory and particle physics, the use of differential geometry methods for systematic derivation of anomalous phase linked Wess-Zumino-Witten items to describe the origins of anomalous topologies and to extend them into higher dimensional space conditions, which has attracted the attention of international colleagues. They have pointed out the importance of molecular beam effects during experiments to measure the qualities of neutrinos and make a contribution to research work on the qualities of neutrinos. A series of work at advanced international levels has been done in the areas of classical and quantitative theories of two-dimensional field models including infinite conservation and solitary particle breakdown. High-level work has been done in gravitational criteria theory, supersymmetry theory, lepton and straton combination modeling, and other areas.

In the areas of statistical physics and condensed state physics, they have used the closed-circuit Green function to deal with statistical questions of equilibrium and nonequilibrium states in a unified manner and used it for concrete questions of critical dynamics, nonlinear response, lasers, spin glass, etc. International attention also has been attracted by research achievements in low-order physics (solitons and fractional charges in one-dimensional high molecular bonds, dynamic behavior of liquid nitrogen membranes), statistical physics modeling theory, chaotic state phenomena, and other areas. Moreover, the institute also created and manages the academic publication LILUN WULI TONGXUN [THEORETICAL PHYSICS NEWSLETTER] (published bimonthly in English) that is sold in China and abroad.

Honorary director: Peng Huanwu [1756 2719 2976]

Director: Zhou Guangzhao [0719 0342 0664]

Party secretary: [blank]

Academic Committee chairman: Zhou Guangzhao

Address: Zhongguangcun, Beijing

Telex: 6158

Telephone: 285957

Institute of Acoustics

The Institute of Acoustics was founded in 1964 and was established on the basis of the acoustics research offices and stations related to the Institute of Electronics. It now has 965 employees including 683 S&T personnel (69 advanced research and technical personnel and 447 middle-level research and technical personnel).

The institute mainly does research on the production, transmission, and reception of soundwaves and related roles of materials as well as the application of new acoustic technologies in various fields. It has integrated with the needs of national development in recent years to develop research on hydroacoustic physics, acoustic signal processing, marine hydroacoustics equipment, hydroacoustic transducers, hypersonics, acoustic surface waves, detection ultrasonics, power ultrasonics, medical ultrasonics, noise control, electroacoustics, speech, atmospheric acoustics, acoustic measurements, computer applications in acoustics, and other topics.

The institute has trained a large number of acoustics research personnel since its founding, and it has achieved rather good research results. It was approved as a nationally advanced unit in 1979 and received a State Council award. It has made 214 achievements since 1978 including 4 topics that received state natural science awards and invention and creativity awards and 49 topics that received academy and provincial/ministerial level achievement awards. In the area of hydroacoustics: shallow sea acoustic field theories and experimental research including normal waves and ray theory, internal waves, sea bottom, signal waveforms, noise fields, seawater absorption, etc. New hydroacoustic technologies: adaptive wave beam formation, digital indicator collection systems, and acoustic signal processing equipment. Civilian acoustic equipment such as shallow strata profilers, fish-finding sonar, air gun sonic sources, etc. In the area of ultrasonics: research on topics that include new types of surface wave components and technologies, large diameter and allotypical lithium niobate monocrystalline growth techniques, ultrasonic processing techniques and transducers, applications of ultrasonics in fuel oil water admixture, ultrasonic diagnostics, and ultrasonic detection. In the area of noise: research on jet air current noise and its control; research on infrasonic reception and location systems, elastic point acoustic location systems, urban noise surveys, Chinese language analysis, speech recognition and vocoders, and research on standard microphones, high-power loudspeakers, etc.

Honorary director: Wang Dezhaoh [3076 1795 2507]

Director: Guan Dinghua [7070 1353 5478]

Acting party secretary: Ma Qiantai [7456 0051 0232]

Academic Committee chairman: Wang Dezhaoh

Address: No 5, Zhongguancun, Beijing

Telex: 7208

Telephone: 283898

Institute of Chemistry

The Institute of Chemistry was founded in 1956. It now has 821 employees including 68 advanced S&T personnel and 399 middle-level S&T personnel.

Scholarly development in the institute is oriented mainly toward polymer chemistry, polymer materials chemistry, and physical chemistry, with corresponding development of analytical chemistry and organic chemistry. It has 19 research offices and laboratories that are engaged in research in such areas as polymer synthesis chemistry, organosilicon chemistry, functional polymers, polymer physics and physical chemistry, special polymers, composite materials, organic solids, organic synthesis, analytical chemistry, humic acid chemistry, organic image recording materials, quantum chemistry, thermal chemistry and chemical thermodynamics, crystal structures, magnetic covibration, vibration spectra, time resolution spectra, molecular beams, computer technologies, etc. It also has a large instruments center, technology office, patent report office, and library, as well as metal working and glass plants.

The institute has published more than 1,500 articles since its founding and made 279 important scientific research achievements. The most prominent during the 1950's and 1960's were: investigation, development, and utilization of salt lakes in the Qaidam Basin of the Qinghai-Xizang Plateau and research on the separation and purification of radioactive materials (post-processing) and separation of boron isotopes, the synthesis of fluorine rubber and process sulfurization, and on photosensitive materials and the chemistry of photosensitivity. Projects that have received state natural science awards and invention awards in recent years include: "Quantitative relationships between molecular structure and function," new methods for lowering the temperature of polypropylene fiber textiles, acid-sensitive metachromatic display plates, new types of collating agents for use in polyvinyl alcohol fiber canvas, determination of the structure of *Erycibe obtusifolia* Benth. alkali, etc. Some of these achievements, such as polyacrylic fibers, organic silicon polymer materials, and others, have provided rather substantial economic benefits.

Honorary director: Liu Dagang [2692 1129 4854]

Director: Zhu Lilan [2612 7787 5695]

Party secretary: Cui Mengyuan [1508 1322 0337]

Academic Committee chairman: Qian Renyuan [6929 0086 0337]

Address: Zhongguancun, Beijing

Telex: 9422

Telephone: 284626 (office)

Institute of Chemical Metallurgy

Preparations for construction of the Institute of Chemical Metallurgy were begun in November 1955, and it was established formally in October 1958. It was returned to Beijing Municipality for a time and returned again to the CAS in 1978. The institute now has 536 personnel including 365 S&T personnel.

The main research orientation of the institute is to focus on China's metallic ore resources, to develop research on the physical chemistry of metallurgical processes and chemical reaction engineering, to utilize and develop new technologies in fluid state, hydrometallurgy and high-temperature metallurgy, and to explore new methods, laws, and processes for separation, extraction, and comprehensive utilization.

Representative achievements since the institute was founded include: 17.5-m blast furnace ferrovanadium magnetite ore smelting experiments, research on top-blown oxygen rotary converter steel making, experiments on new flow processes for using roasting-ammonia immersion-hydrogen wet method reduction to extract nickel and cobalt for reduction of Albanian laterite ore, development of compound coating powders (nickel coated aluminum, cobalt coated carbonized tungsten, nickel coated graphite), "dispersed fluidization in chemical alloys," "basic questions in the intensive blast furnace smelting process," shaft furnace phosphorous smelting, top-blown oxygen rotary converter smelting of high phosphorous pig iron, top-blown pure oxygen method smelting of vanadium-bearing pig iron, two-phase fluidized magnetized roasting of lean iron ore, high-pressure wet method metallurgy for east Sichuan oxidized copper ore, copper and cobalt extraction from low quality copper and cobalt oxidized iron ore, research on the use of sodium hydroxide for high pressure immersion extraction processing of smaltite, research on using the high-frequency plasma gas state oxidation method to manufacture and extract the coating material titanium white, etc.

Director: Guo Musun [6753 1970 1327]

Party secretary: Yang Yupu [2799 3768 3877]

Academic Committee chairman: Guo Musun

Address: Zhongguancun, Haidian Qu, Beijing

Cable address: 9129

Telephones: 284241; 281358

Institute of Photochemistry

The Institute of Photochemistry was established in 1975. Its predecessor was the organic and catalysis sections of the Institute of Chemistry. The institute now has 392 people including 267 S&T personnel (24 advanced S&T personnel and 149 middle-level S&T personnel).

The institute is engaged mainly in research on photosensitive chemistry and photochemistry. The institute has 23 research offices that are engaged in research in the areas of photochemistry and science, organic and polymer photochemistry, colloid and surface chemistry, the structural chemistry of natural pigments, photoelectric chemistry, silver salts photosensitive materials, organic information materials, photograph evaluation and photosensitive measurement tests, chemical conversion of solar energy and energy storage, precision organic synthesis and dispersion, new emulsification techniques, and other areas. It also has a large instruments lab, technical office, printed information office, and machine repair plant. A new technical development company has been established to promote scientific research toward economic construction.

More than 100 scientific research achievements have been made since the institute was established. The most prominent among them are: satellite photography, aerial color photography, high-speed one-step photography and laser high-speed information recording, and other special photosensitive materials; low silver fast X-ray plates, highly sensitive color and color reversal plates, astronomical dry plates and other photosensitive materials; minute processing of photoetching materials, polymer photofixing materials, high dispersion techniques, evaluation of photosensitive process information transfer and image evaluation, color coupler synthesis, high purity gelatin and its modified gel, the relationship between the minute structure of halogenated silver crystals and photosensitive performance, research on the principles of multigrade enlarged image formation, research on photosensitivity and photooxidation, research on polymer photostabilization and photosensitive polymerization, research on charge transfer photochemical reactions, research on mutual roles of excited state molecules, research on the structure and action of phycoerythrin, etc.

Director: [blank]

Party secretary: Hu Zhendan [5170 7201 2481]

Academic Committee chairman: [blank]

Address: Beishatan, Deshengmenwai, Beijing

Telex: 1949

Telephone: 277061

Institute of Environmental Chemistry

The Institute of Environmental Chemistry was founded on the basis of the former No 2 Department of the Institute of Chemistry in March 1975.

During its early stages, the Institute of Environmental Chemistry was involved mainly in the development of research work related to environmental inorganic analysis, environmental organic analysis, control and treatment of environmental pollution sources, and other areas. It developed research on the chemistry of environmental pollution after 1977 and was entrusted by the CAS to prepare research work related to carbohydrate compounds. In accordance with disciplinary development needs in recent years, it established 11 research offices in the areas of inorganic analysis, organic analysis, water pollution chemistry, atmospheric pollution chemistry, farm chemical pollution chemistry, regional environmental chemistry, catalysis and mutation, polymer membranes, organic synthesis, analytical instruments, and information research. Moreover, it set up a public laboratory and central laboratory. The editorial office is responsible for editing HUANJING KEXUE XUEBAO [JOURNAL OF ENVIRONMENTAL SCIENCES], HUANJING KEXUE [ENVIRONMENTAL SCIENCES], AND HUANJING HUAXUE [ENVIRONMENTAL CHEMISTRY] that are published openly in China and abroad. The CAS Environmental Sciences Information Network and the Chinese contact point of the International Environmental Information Sources Inquiry System of the U.N. Environmental Planning Office are located at the institute.

The institute currently has over 500 employees including more than 350 S&T personnel. The institute has 9 researchers, 20 associate researchers, and 3 assistant copy editors. Since its founding, the institute has done a great deal of work and made several achievements related to technologies for dealing with the industrial "three wastes" [waste gas, waste water, and industrial residue], research on analytical methods for inorganic and organic pollutants and their standardization, development of reference materials on environmental standards, development of environmental analysis and monitoring instruments, research on the structure and toxicity of carcinogens and other organic pollutants, the shape and distribution of heavy metal pollutants in bodies of water, numerical models of water quality, evidence of atmospheric fly ash particles, evaluation of environmental influences, research on acid rain, research on environmental information, publication of environmental science periodicals, and other areas.

Director: Liu Jingyi [0491 7234 1355]

Party secretary: He Shihuan [0149 0013 1403]

Academic Committee chairman: Liu Jingyi

Address: Xiaozhuang, Qinghuadonglu, Haidian, Beijing

Telephone: 284946 (office)

Beijing Observatory

The Beijing Observatory was founded in 1958. It now has 503 employees including 411 S&T personnel (25 advanced researchers and 161 middle-level S&T personnel). It has research offices for stellar physics, solar physics, radio-astronomy, astrometry, latitude, and other areas, and a subsidiary factory as well as four monitoring stations at Shahe, Miyun, Xinglong, and Tianjin.

The Beijing Observatory is a comprehensive astronomical observatory that concentrates on astrophysics while also developing observation and research on time, latitude, man-made satellites, and other areas. Since its founding, the institute has undertaken research on the physics of active solar regions and forecasts of solar activity, research on observations and photometric orbits of close binary stars and eruptive variable stars, research on solar radio, cosmic radio, and radio technologies and methods, research on 3.2-cm and 10-cm radio telescopes, meter wave radio compound interferometers and synthetic aperture radio telescopes, research on optical telescope terminal technologies, time and latitude observations and services, monitoring work for man-made satellites, and other areas. CAS first-place achievement awards have been received for world time measurements and for observation and preliminary results of total solar eclipse flash spectra and other things.

Observatory director: Wang Shouguan [3769 4849 3828]

Acting party secretary: Wang Xufa [3769 2485 4099]

Address: Zhongguancun, Beijing

Telex: 9053

Telephone: 281261

When we are listening to the radio, each station broadcasts six clear flute tones on the hour, the last tone being the exact hour. How do the stations check the time? Originally, the Central People's Broadcasting Station had a direct line to the CAS Beijing Observatory and used this line to check their clocks with the observatory. The observatory used observations of the locations of celestial bodies to determine the time.

Institute of Geography

The Institute of Geography was established in Nanjing in 1953 and moved to Beijing in 1958. It now has around 580 employees, about 70 percent of whom are research and technical personnel, including 9 researchers and 39 associate researchers.

The Institute of Geography is involved mainly in research on the structure, formation, and evolutionary laws of China's geographical environment and focuses on research concerning the laws of the interchange of material and energy between the various factors of the geographical environment and their manifestation in different zones and regions. On the basis of intensive research concerning the natural productive potential of agriculture, water cycle mechanisms and the transport and conversion of chemical elements, as well as the formational and evolutionary laws of terrain, climate, organisms, and other primary natural geographical factors, it has developed theories on the natural geography of China, and it has developed theories of China's human geography on the basis of developing geographical research on the distribution of production, man-land relationships, and other areas. In addition, it also is engaged in research on cartography and world geography. It has provided a scientific foundation for the directional utilization, transformation, and conservation of nature.

Since its establishment, the institute has made certain achievements in comprehensive regional investigations, zoning, planning, atlases, and other areas, and it has organized and edited ZHONGGUO ZIRAN QUHUA [NATURAL ZONING IN CHINA], the Economic Geography Section of ZHONGGUO DILIZHI [ANNALS OF CHINESE GEOGRAPHY], ZHONGHUA RENMIN GONGHEGUO ZIRAN DITUJI [NATURAL ATLAS OF THE PRC], ZHONGGUO NONGYE DILI [AGRICULTURAL GEOGRAPHY OF CHINA], ZHONGGUO ZIRAN DILI [NATURAL GEOGRAPHY OF CHINA], the "1:1,500,000 Map of China," the ZHONGGUO HAIJI LINHAI QIHOU TUJI [CLIMATOLOGICAL ATLAS OF CHINA'S SEAS AND NEAR-SEA AREAS], and other works as well as a series of special treatises on regional and topical research reports. Moreover, it also edits and publishes DILI YANJIU [GEOGRAPHICAL RESEARCH], DILI YIBAO [GEOGRAPHY TRANSLATIONS REPORT], DILI ZHISHI [GEOGRAPHICAL KNOWLEDGE], and other publications. It has research offices for natural geography, hydrology, climatology, geomorphology, chemical geography, mapping, paleogeography and historical geography, world geography, technology, agricultural geography, industrial and communications geography, urban geography, human geography, and other areas, as well as experiment stations at Yucheng in Shandong and Datun in Beijing. Moreover, it also has laboratories for fluvial terrain modeling, runoff modeling, spore-pollen and environmental chemistry analysis, environmental physics analysis, map-making and printing, etc., as well as a printed information office.

Honorary director: Huang Bingwei [7806 4426 4850]

Director: Zuo Dakang [1563 1129 1660]

Party secretary: Deng Fei [6772 7378]

Academic Committee chairman: Huang Bingwei

Address: No. 917, Datun, Deshengmenwai, Beijing

Telex: 9135

Telephone: 446551

Institute of Atmospheric Physics

The predecessor of the Institute of Atmospheric Physics was the pre-liberation Central Research Academy's Meteorology Institute. It was combined with the CAS Institute of Geophysics in 1950, and the institute was established formally in April 1966 and named the CAS Institute of Atmospheric Physics. It now has over 480 employees including 29 advanced researchers and 180 middle-level S&T personnel. The institute has 12 research offices.

During the 1950's, the institute was involved mainly in research on weather dynamics. During the early 1960's it developed research on cloud and mist physics, thunder and lightning physics, atmospheric sounding, and other atmospheric physics questions and numerical forecasts. During the 1970's, it developed research on satellite meteorology, atmospheric pollution and earth hydrokinetics.

The institute has had 45 major scientific research achievements since its founding. Examples include the effects of the Qinghai-Xizang Plateau on atmospheric circulation in east Asia, theories of warm cloud precipitation, cumulus cloud dynamics, laws of activity in atmospheric systems, and so on. Moreover, it also developed China's first laser cloud detection radar and a series of equipment for receiving meteorological satellite cloud maps, and it also developed work related to analysis and utilization of satellite cloud maps.

Honorary director: Ye Duzheng [0673 4648 2973]

Director: Zeng Qingcun [2582 1987 1317]

Acting party secretary: Zhao Tongzhuang [6392 0681 8369]

Academic Committee chairman: Ye Duzheng

Address: No 7, Qijiahuozi, Deshengmenwai, Beijing

Cable address: 5000

Telephone: 446551-456

The Atmospheric Pollution Automatic Monitoring Network System

This system, developed and produced by the CAS Institute of Computing Technology is a comprehensive computerized network system that is used to monitor atmospheric pollution. It includes 1 central station and 6 substations, each of the substations being equipped with 11 types of pollution or atmospheric parameter instruments that can process data as needed or in batches for automatic monitoring of atmospheric pollution conditions throughout the region, and they can draw charts. Operations at the central station are done using the Chinese language, and the substations operate automatically and unattended. They are China's largest scale and most functionally complete monitoring system.

Institute of Geophysics

The Institute of Geophysics was founded in Nanjing in 1950 and moved to Beijing in 1954. It now has 400 employees, 250 of them S&T personnel (including 20 advanced researchers). The institute has 10 research offices covering the areas of crustal and upper mantle physics, the dynamics of earth structures, theoretical geophysics, magnetosphere theory, geomagnetism, new technologies, prospecting geophysics, gravity and structures, paleogeomagnetism, and intelligence and information. Moreover, it also is preparing to build a geothermal and geodesic electromagnetic depth measurement research office, a medium-sized computer system, and an automated geomagnetic standard experiment center.

This institute is a comprehensive research institute that focuses on solid geophysics. It applies the theories, methods, experiments and observations, and other methods of modern geophysics to study the various characteristics of the geophysical field. The focus is on study of crustal and upper mantle physics, lithosphere dynamics, high temperature, and high pressure rheology of rocks, energy (petroleum and geothermal), and the distributional laws of resources.

During its early period, the institute set up a national network of seismological and geomagnetic reference standard stations (now under the state Seismology Bureau system) and an artificial seismic flow observation system. It has carried out comprehensive geophysical examinations of the Qinghai-Xizang Plateau, the eastern part of China and the Panxi structural zone and achieved important results. Preliminary results have been obtained in research work related to crustal and upper mantle physics, earthquake genesis and formation, characteristics of deep structures in the crust, the distributional regularities of oil and gas fields, and other questions. Progress has been made in research concerning continental plates, especially the characteristics of the geophysical field in intra-plate structures, and in theoretical geophysical inversion calculation methods. It has developed large-scale national geomagnetic surveys and compiled a geomagnetic map of China. It has compiled a national outline distribution chart for the depth of China's crustal structures and supplied the basic outlines of deep crustal structures in China. It has designed and developed geomagnetic recorders, geomagnetic transits, natural seismographs, deep well underground thermal current measurement systems, artificial seismic observation recording systems, geodesic electromagnetic depth measurement systems, and other geophysics instruments that are similar to or approximate international levels.

Honorary director: Fu Chengyi [0265 2110 5030]

Director: Chen Zongji [7115 1350 1015]

Acting party secretary: Zhang Lianchen [1728 6647 5256]

Academic Committee chairman: Chen Zongji

Address: Qinghuadonglu, Beijing

Telex: 7594

Telephone: 651031

Institute of Geology

The Institute of Geology was established in May 1951. It originally was located in Nanjing but moved to Beijing in 1954. It was placed under the State Seismology Bureau in 1970, from which it was separated and returned to the CAS in 1978. It has 11 research offices, 1 printed information publishing office, and a rock and minerals exhibition hall. The 11 research offices are the stratigraphic research office, the mineralogy research office, the geotectonics research office, the geothermics and geomathematics research office, the engineering geomechanics research office, the petrology research office, the sedimentology research office, the isotopic geology research office, the central rock and mineral material components analysis office, the rock and mineral physical testing and examination laboratory, and the Quaternary geology research office.

Shortly after it was established, the institute was involved mainly in research in the areas of mineral prospecting, engineering construction, uncharted regions, and other areas. Later, it focused on the establishment and development of many branch disciplines in the geological sciences in China. In 1958, it began developing research on rare elements, radioactive elements and isotope geology and established and developed geochemistry. After 1966, it focused on development of work in seismogeology. Its current activities mainly involve development of comprehensive multidisciplinary research using many different measures to explore certain characteristics and basic laws related to China's resources, energy resources, and engineering environment in order to provide a scientific foundation for transformation of the engineering environment and natural environment and for disaster prevention. On this basis, it does research on the composition and structure of the lithosphere and on the basic laws of geological evolution for intensive exploration of the geological evolution of China and global structural questions.

Since its founding, the Institute of Geology has provided theories of nuclear geology, published the first 1:4,000,000 geodesic structural map of China and the first 1:5,000,000 marine and continental geodesic structural map of China and nearby regions, and created the theory of fracture systems and fault-block structures. It provided a theory on terrigenous derivation and mineral formation, and it has systematically described research achievements related to loess in China. It established rock body engineering geomechanics and developed a series of important rock and mineral data. It created China's first important group of geology laboratories and made a contribution to the establishment of the nation and to the development of science. By 1982, it had made a total of 647 S&T achievements including 1 first place, 2 second place, and 4 third place state natural science awards. It also has received 24 State Science Commission superior S&T achievement awards and 9 first place CAS, ministry, and commission superior S&T achievement awards.

Honorary director: Zhang Wenyou [1728 2429 0147] (deceased)

Director: Sun Shu [1327 2873]

Party secretary: Hu Fuyou [5170 6534 0147]

Academic Committee chairman: Zhang Wenyong (deceased)

Address: Qijiahuozi, Deshengmenwai, Beijing

Telex: 6347

Telephone: 445913

Commission for Integrated Survey of Natural Resources

The Commission for Integrated Survey of Natural Resources was founded in 1956. The State Council decided in 1982 to place it under the dual leadership of the CAS and the State Planning Commission. The committee now has over 330 members including 24 advanced research personnel at the level of associate researcher and above and 92 middle-level research personnel. It has seven research offices for land resources, water resources, climatic resources, biological resources, resource economics, industrial layout, and computer applications as well as three subsidiary offices for technology, printed information, and editing and publishing.

The committee is a functional organization of the CAS that is responsible for the organization and coordination of comprehensive survey research work concerning questions related to the evaluation, development, utilization, and protection of natural resources. At the same time, it is a research organization that has several research offices and develops comprehensive research in the areas of natural resources and the layout of the forces of production. Its basic tasks are: to organize, coordinate and take responsibility for comprehensive survey research work related to natural resources, to provide programs and suggestions for territorial renovation and, moreover, to develop research on theories, methods, and applications of new technologies related to natural resources.

The committee has organized more than 30 comprehensive survey teams since the 1950's. It has carried out comprehensive survey research in a fairly systematic manner concerning natural conditions and natural resources and their rational development and utilization in the northeastern, northwestern, southwestern, southern, and other regions of China. It has made a contribution to rational development and utilization of natural resources, especially regional ones, and provided a large number of survey research results. The most prominent are: selection of areas suitable for the planting of rubber plantations in 6 provinces (and autonomous regions) in southern China, long-range plans and 10 academic treatises concerning the development and utilization of agricultural natural resources and rational distribution of agriculture in Xinjiang, long-range plans for rational development and utilization of natural resources and for industrial and agricultural development in Nei Monggol and Ningxia, and 8 academic treatises concerning Nei Monggol, and 34 academic treatises and large picture books of the Qinghai-Xizang Plateau (Xizang region).

Its scholarly publications include ZIRAN ZIYUAN [NATURAL RESOURCES] magazine and ZIRAN ZIYUAN YICONG [TRANSLATED ARTICLES ON NATURAL RESOURCES], and it has been entrusted by UNESCO with editing and translating the magazine ZIRAN YU ZIYUAN [NATURE AND RESOURCES] (Chinese edition). All natural resource research committees under national scientific coordination are registered with the committee.

Director: Sun Honglie [1327 7703 3525] (concurrent)

Party secretary: Zhao Xunjiang [6392 6064 4842]

Academic Committee chairman: Li Xiaofang [2621 1321 5364]

Address: No 917, Datunlu, Deshengmenwai, Beijing

Telephone: 446551 (transfer)

Telex: 4844

Institute of Vertebrate Paleontology and Paleoanthropology

Shortly after liberation, the Institute of Vertebrate Paleontology and Paleoanthropology was the Cenozoic Research Office under the State Geological Guidance Committee. It was changed to the Vertebrate Paleontology Research Office in 1953 and placed under the jurisdiction of the CAS. It was changed to the Institute of Vertebrate Paleontology in 1957 and again to the Institute of Vertebrate Paleontology and Paleoanthropology in 1960. It now has more than 240 personnel and 4 research offices for paleoichthyology, paleoherpetology (including amphibians and birds), paleomammalogy and paleoanthropology as well as a specimen hall and the Zhoukoudian *Homo erectus pekinensis* relictswork station.

The research in this institute covers to areas. The first is vertebrate paleontology, which focuses on research concerning the shape, structure, systematic taxonomy, origins, development, differentiation and adaptation of fish, amphibians, reptiles, birds and mammals, as well as the regularities in their temporal and spatial distributions. It also is engaged in research related to paleogeography, paleoclimatology, paleocology, paleobiochemistry, and other areas. In the area of paleoanthropology, the research focus is on fossils of ancient man and Paleolithic culture, descriptions of the origins and development of mankind and the paleoanthropological environment, and developmental regularities of Paleolithic cultures. In recent years, it has developed research on applied anthropology and the physical characteristics of modern man and done a bit of work to establish a system of standards for the shape of human skulls in China, skull restoration, and other areas.

The institute has made many achievements and important discoveries in regional, stratigraphic, and vertebrate class surveys, and in research on stratigraphic zoning. The most prominent include: research on the red beds and paleontology of vertebrate groups in southern China, research on the Cenozoic at Lantian in Shaanxi and on the Lantian ape man and mammalian groups, research on vertebrate fossils and the related continental facies strata in Xinjiang and Nei Monggol, Mesozoic and Cenozoic vertebrate surveys in Xizang, the discovery and study of the ancient apes and mammalian groups of Lufeng in Yunnan, research on the strata positions of the fossilized fish of each era in China, research on Paleolithic cultures in the Guanyin Caves of western Guizhou, comprehensive research on the traces of *Homo erectus pekinensis*, research on systemized standards for the shapes of adult human heads in China, and other areas.

Director: Zhang Miman [1728 1736 2581]

Party secretary: Su Jianmin [5685 1696 3046]

Academic Committee chairman: Zhang Miman

Address: 142 Xizhimenwai Dajie, Beijing

Telex: 1877

Telephone: 891363

Institute of Biophysics

The Institute of Biophysics was founded in 1958. Its predecessor was the CAS Beijing Experimental Biology Work Station. It now has 796 employees, of which 566 are specialized technical personnel of various categories, including 6 researchers, 31 associate researchers, 3 advanced engineers, 258 assistant researchers, 53 engineers, and 59 technicians. It has 14 research offices in such areas as radiation biophysics, nucleic acids, enzyme structure and functions, biomembranes, biomacromolecular crystal structures, receptor biophysics, cell biophysics, oncology, biophysical engineering technologies, biophysical experiment technologies, and information research as well as 2 subsidiary factories.

The institute at present is engaged primarily in research work in various areas of molecular biology and biophysics. In molecular biology, the focus is on research concerning the structure and function of biomacromolecules and their artificial synthesis, and on biomembranes and membrane systems. In biophysics, the focus is on research on the physics of life and activity and on physical and chemical processes and laws as well as on biophysics technologies.

In the area of radiation biology, the institute undertook radiation baseline surveys for all of China and developed instruments for radiation measurement and monitoring during its early period, and also was engaged in research concerning the mechanisms of injury and recovery of large and small radiation doses on organisms. Prominent achievements in recent years include: determination of the crystal structure rhombohedral 2-zinc pig's insulin at a resolution of 2.5 Å and 1.8 Å; determination of the crystal structure of Qinghaosu II [a Chinese herb]; oligoprotein binding with ligand-statistical mechanical Models I, II; and development of automatic liquid scintillation spectra equipment, fluorescent spectrophotometers, paramagnetic resonance spectrometers, and an ultracentrifuge at the speed of 60,000 rpm.

Honorary director: Bei Shizhang [6296 2514 3864]

Director: Liang Dongcai [2733 2767 2624]

Party secretary: Ma Zhongguang [7456 6850 0342]

Academic Committee chairman: Liang Dongcai

Address: Zhongguangcun, Beijing

Telex: 8367

Telephone: 283165

Institute of Microbiology

The Institute of Microbiology was established in 1958. Its predecessor was the CAS Beijing Laboratory of Microbiology and the Institute of Applied Mycology. The institute now has more than 350 employees including over 40 advanced S&T personnel. It has eight research offices, one technology office, and one fermentation experiment plant.

The eight research offices are: the fungal taxonomy research office, the bacteriology research office, the virology research office, the microbial physiology and ecology research office, the microbial metabolism research office, the microbial enzyme research office, the microbial genetics research office, and the bacterial variety preservation research office.

Since its establishment, the institute has done a great deal of research in the areas of microbial taxonomy, ecology, physiology and biochemistry, biophysics, genetics, bacterial variety preservation, and other basic research as well as in such areas as microbial development and utilization, and so on, and it has made more than 100 scientific research achievements. The most prominent achievements in recent years are: research on amino acid fermentation, a new two-step technique for fermenting vitamin C, preparaffin fermentation for producing binary acids, development and application of various types of zymins, biochemical treatment of industrial waste water, prevention of plant viral diseases, and other areas. It has accumulated a large amount of basic information in the area of basic research. The institute had issued nearly 800 research articles by the end of 1983.

Honorary director: Xue Yugu [5641 4416 6253]

Party secretary: Zhang Yongqing [1728 3057 1987]

Academic Committee chairman: Xue Yugu

Address: Zhongguancun, Beijing

Telephone: 282057

A Major Reform in Monosodium Glutamate Production

Before the 1970's, production of 1 ton of MSG in China consumed 36 tons of wheat and more than 10 tons of hydrochloric acid, and also was associated with a great deal of pollution by hydrochloric acid fumes. The CAS Institute of Microbiology separated and selectively bred a new variety of bacteria with high glutamic acid output that permitted the achievement of industrialized production for MSG fermentation from glutamic acid. The new method uses only 5 tons of corn or dried sweet potatoes to make 1 ton of MSG. This has reduced costs a great deal and also improved the pollution situation. All MSG production in China now employs this technique, which saves about 1.5 million tons of grain each year.

Institute of Genetics

The predecessor of the Institute of Genetics was the Experimental Establishment of Genetics and Plant Breeding that was established in 1951. Later, it was renamed the Genetics and Cultivation Research Office and Genetics Research Office. The Institute of Genetics was established in 1959.

Before the Institute of Genetics was established, it was involved in research related to crop cultivation and genetic seed selection. After the institute was formally established, it added animal and microbial genetics contents. The institute now has seven research offices, one technology office, and one experiment field. The main research content includes: molecular genetics and genetic engineering, animal genetics, plant cell genetics and cell engineering, the relationship between cytoplasm and nucleoplasm, evolutionary genetics, human medical genetics, and new technologies and methods for genetic breeding.

The institute has made nearly 100 research achievements since its establishment. The most prominent ones concern anther culture of wheat, rice, corn, hevea rubber and sugar cane and pollen grain culture of rice, the breeding of hybrid corn and sorghum varieties, and new varieties of wheat, sugar cane and cotton, and their use in production over a large area. Obvious achievements have been made in the area of overcoming incompatibility and sterility in distant hybrids, which has led to progress in research on subtilysin conversion, subtilysin amylase regulation, and formation of subtilysin spores. Blank areas in China have been filled in the areas of eucaryote RNA polymerase, research on the characteristics of immune RNA synthesis, fertilized egg transplantation in cattle and sheep, in early diagnosis of genetic diseases in humans, and in other areas. These achievements have made definite contributions to the development of agriculture and industry, to national defense, to medical treatment and health, and to basic theoretical research.

Director: Hu Han [5170 0698]

Party secretary: Zhong Hui [6988 6540]

Academic Committee chairman: Hu Han

Address: No 917, Datunlu, Deshengmenwai, Beijing

Telex: 6695

Telephone: 446551, extension 547

Institute of Psychology

Preparations for construction of the Institute of Psychology began in 1950 and it was formally established in 1956. It was closed down during the "Cultural Revolution" and restored in 1977. It now has six research offices: the development psychology research office, the perception research office, the physiological psychology and abnormal psychology research office, the basic psychological theory research office, the human engineering research office, and the information research office. The institute now has 156 employees including 127 scientific research personnel (24 advanced researchers and 85 middle-level researchers).

The Institute of Psychology is a comprehensive research organization that studies the laws of human psychological activity and explores psychological questions in socialist construction in China. In recent years, the Institute of Psychology has strengthened applied research that is integrated with present realities to open up several new research spheres like research on enterprise management psychology, research on artificial intelligence, research on aviation human engineering, research on old-age psychology, research on the psychological characteristics and educational problems, of only children, etc.

The institute has made many achievements since its establishment in such areas as perceptual psychology, development psychology, educational psychology, medical psychology, physiological psychology, human engineering and management psychology, and in research on basic psychological theories, etc. The primary achievements in recent years include research on the conceptual development of children, research on the psychological development of above-normal and below-normal children, visual function research on factory and mine illumination standards, research on the basic parameters of stereo vision, research on skin color standards for Chinese people, research on noise prevention, research on psychological factors in acupuncture anaesthesia, research on brain mechanisms in learning and memory, research on the human engineering of aircraft cockpit illumination, research on computer comprehension of the Chinese language and research on certain basic theoretical questions in psychology. The institute also has explored computer applications in psychological research and achieved preliminary results.

Honorary director: Pan Shu [3382 5486]

Director: Xu Liancan [1776 5114 0221]

Party secretary: Li Puxin [2621 3184 2450]

Academic Committee chairman: Pan Shu

Address: Zhongguancun, Beijing

Telex: 1800

Telephone: 282048

Institute of Developmental Biology

The Institute of Developmental Biology was established in September 1979. Its predecessor was the Department of Cytology of the Institute of Zoology. This institute is a single discipline research institute that now has more than 50 S&T personnel, 5 research groups, an animal building, a library, and various public laboratories, as well as other facilities.

This institute mainly does research at the cellular, subcellular, and molecular levels to study higher organisms and the individual developmental laws of humans. It is engaged in research on cell differentiation and reversal during the process of embryonic development during the early stages, gene expression and regulation, gene transfer and genetic control, and other major basic biological questions of the development process. Moreover, on this basis it further explores the possibility of controlling these regularities to solve important and real problems in agriculture and medicine. The focus of work in recent years has been on methods for cell nuclei transplantation and introduction including genes as combined source genetic information material and artificial mosaic organisms, and on research concerning the controllability and laws of change of genetic properties during the individual development process of higher organisms as well as questions of their transmission to later generations. Moreover, it gradually is developing research on applications of genetic engineering methods now used for lower organisms within its own sphere so that research results not only benefit the development of the basic sciences as quickly as possible but also make it feasible to resolve important comprehensive applied research topics that include human eugenics, prevention of genetic diseases and cancer, creating new varieties of valuable animals and plants, and other real problems.

Director: [blank]

Party secretary: Chen Zhaolin [7115 3564 2651]

Academic Committee chairman: [blank]

Address: Zhongguancun, Beijing

Telex: 3160

Telephone: 281951

Institute of Zoology

Shortly after the nation was founded, the CAS organized the Institute of Zoology and Institute of Entomology. The two were combined into the present Institute of Zoology in 1962. It now has 386 S&T personnel including 64 advanced S&T personnel. It has 10 research offices: the invertebrate taxonomic classification system, the insect taxonomic classification system, the vertebrate taxonomic classification system, animal ecology, insect ecology, insect physiology, insect hormones, insect toxicology, endocrinology, and cytology research offices. It also has four auxiliary scientific research departments: a central laboratory, a printed information office, an animal raising office, and an academic society office. The Zoology Society, Entomology Society, and Ecology Society are registered with the institute and they publish seven scholarly publications including DONGWU XUEBAO [JOURNAL OF ZOOLOGY], KUNCHONG XUEBAO [JOURNAL OF ENTOMOLOGY], DONGWU FENLEI XUEBAO [JOURNAL OF ZOOTAXONOMY], SHENGTAI XUEBAO [JOURNAL OF ECOLOGY], DONGWUXUE JIKAN [COLLECTED PAPERS IN ZOOLOGY], etc. The institute has 2.5 million insect specimens, over 100,000 invertebrate specimens, and 160,000 vertebrate specimens.

The Institute of Zoology is engaged primarily in research on animal taxonomic classification systems to provide a scientific basis for development, utilization, control, and protection. It is involved in research on the mechanisms of animal adaptation to environments and ecosystems and laws of numerical growth and decline of primary economic [valuable] animals, and it makes use of rational pesticide application and environmental toxicology as well as natural enemies, microbes, and insect pheromones, and other areas to explore comprehensive control theories and measures for dangerous animals and to protect the ecological equilibrium. It studies the behavior, nutrition, and metabolism of individual animals, especially hormone regulation and control of reproduction and the principles of their actions to provide a theoretical basis for their utilization in the breeding of economic animals and birth control for humans. In the area of cytology, it studies questions related to biomembrane structure and functions and the mechanisms of aging in cells, and other questions.

The institute has made more than 250 scientific research achievements since it was founded, the most prominent being: research on permanent control of locusts, research on regularities in the occurrence of cotton insects, armyworms, pine moths, and other insects and comprehensive controls, research on rodent hazards, determination of the structure of insect pheromones, their chemical synthesis and application in forecasting, the utilization of animal hormones in livestock breeding, development and utilization of new farm chemicals, surveys and artificial raising of natural enemies, recombination of chondriosome ATP enzymes, peptide hormone evolution, research on hormone receptors, and other questions. At the same time, it also cooperates with related units to edit ZHONGGUO DONGWU ZHI [ANNALS OF ZOOLOGY IN CHINA], ZHONGGUO JINGJI DONGWU ZHI [ANNALS OF ECONOMIC ANIMALS IN CHINA], ZHONGGUO JINGJI KUNCHONG ZHI [ANNALS OF ECONOMIC INSECTS IN CHINA], and other publications.

Honorary director: Chen Shixiang [7115 0013 7534]

Director: Zhao Jianming [6392 1696 6900]

Acting party secretary: Yang Shusen [2799 2885 2773]

Academic Committee chairman: Zhao Jianming

Address: Zhongguancun, Haidian, Beijing

Cable address: 3436

Telephone: 282219

Institute of Botany

The Institute of Botany was founded in 1950. It formerly was called the Plant Taxonomy Institute but was given its present name in 1953. It now has 797 employees including 462 S&T personnel (75 advanced S&T personnel). It has 9 research offices: the plant taxonomy, plant ecology and geobotany, plant morphology, plant cytology, paleobotany, plant physiology and biochemistry, photosynthesis, biological nitrogen fixation and plant chemistry, and 1 botanical garden, and it also has China's largest specimen hall, containing more than 1.4 million dried leaf specimens, more than 500,000 moss specimens, more than 130,000 pteridophyta specimens, and more than 14,000 plant fossils.

The main focus of this institute is on rational development and utilization of China's plant resources as well as on certain major questions in agriculture, environmental protection, and geological prospecting. It is engaged in survey research concerning plant taxonomy, plant classification systems, paleobotany, plant ecology and geobotany, plant chemistry, plant introduction and domestication, plant morphology, plant cells, and plant physiology. At the same time, it also works in accordance with trends in the field of botany to develop research on individual plant development, cell differentiation, system development, the relationships between plants and the environment, and other theoretical questions.

The institute has made more than 350 scientific research achievements and published more than 2,000 scholarly articles and 89 monographs since its founding. The main ones are ZHONGGUO ZHIWU ZHI [ANNALS OF CHINESE BOTANY] (a total of 80 volumes, more than 20 of which have been completed mainly by this institute), ZHONGGUO GAODENG ZHIWU TUJIAN [CHART OF HIGHER PLANTS IN CHINA], ZHONGGUO JINGJI ZHIWU ZHI [ANNALS OF ECONOMIC PLANTS IN CHINA] (edited in conjunction with the Ministry of Commerce), ZHONGGUO ZHIBEI QUHUA [ZONING OF CHINESE VEGETATION], ZHONGGUO ZHIBEI [CHINESE VEGETATION], ZHONGGUO ZHIWU BAOFEN XINGTAI [CHINESE PLANT SPORE MORPHOLOGY], etc. It has discovered several oil crop and edible plants and Chinese herbal medicines, and it has introduced and domesticated many new types of trees, aromatic plants, improved grass varieties, flowers, and Chinese herbal medicines. It has bred several improved tobacco, rice, wheat, and other farm crop varieties. It has used organized cultivation for successful rapid reproduction of seedless watermelons, crabapples, Chinese white poplar and several flowers, and it has carried out industrialized production. Detoxification and restoration of health to potato cuttings had made a contribution to solving the problem of varietal regression. In the area of basic theories, progress has been made in research on cell nucleus wall penetration and nucleus regeneration, many routes of research on higher plant absorption and metabolism, research on the structure and functions of photo system II chlorophyll protein compounds and chloroplast membranes, and some scientific research on gymnosperms and other areas.

Honorary director: Tang Peisong [3282 0160 2646]

Director: Qian Yingqian [6929 6601 0241]

Party secretary: Zhao Fahai [6392 3127 3189]

Academic Committee director: Tang Peisong

Address: 141 Xizhimenwai Dajie, Beijing

Telex: 2891

Telephone: 894973

Institute of Computing Technology

Construction of the Institute of Computing Technology began in 1956 and the institute was established formally in 1958. It was placed under leadership of the National Defense Science Commission from 1967 to 1975. The institute has more than 20 research offices in the areas of computer systems, system structure, computer networks, computer software, magnetic recording technologies, automation of digital system design, etc., and it has a subsidiary experimental factory. It now has more than 1,500 employees including about 1,000 S&T personnel and more than 90 people with advanced technical titles.

The tasks of the institute are to study and develop new types of computer systems focused on large computers, to study and develop computer networks, software and magnetic recording technologies, new theories, technologies and techniques for computer assistance projects, etc., to develop computer applications in certain important realms and to develop basic research on computer science and related disciplines.

Since its founding, the institute has developed 22 types and 32 models of various computer systems according to the needs of the state on the basis of developing research on all types of topics. Examples include the 103 computer, the first electronic computer system developed in China in 1958, the 109-B computer, the first transistor computer system developed in China in 1965, the 013 computer, a large general purpose integrated computer system developed in 1976, and the 757 computer, a large scale integrated circuit computer system with a speed of 10 million operations per second in 1983.

Director: Zeng Maochao [2582 5399 2600]

Party secretary: Zeng Maochao

Academic Committee chairman: Zeng Maochao

Address: Zhongguancun, Beijing

Telex: 4615

Telephone: 283131

The 757 engineering 10 MHz computer was developed through cooperation by the CAS Institute of Computing Technology with more than 50 units. This computer is a large-scale general purpose computer system centered on vector computing. Its average calculation rate is 10 million operations per second in vector operations and 2.8 million operations per second in scalar operations. There are more than 200,000 instructions in its software system, all of it automatically compiled. The birth of the 757 computer is of great significance in the history of computers in China.

Computing Center

Construction of the Computing Center began in 1973, and in 1977 it was transferred to the Computer Mathematics Research Office of the Institute of Computing Technology and some research personnel in the Institute of Mathematics for formal establishing of the Computing Center. Its primary tasks are to develop scientific computing and research on applied software and applications for nonnumerical values, to take responsibility for major computer tasks and applied software development in the area of data processing as suggested by the CAS and other units, to carry out computer maintenance and management, to engage in development of computer network projects and provide machine time, to develop extension and exchanges for developing applied research on microprocessors and applied computer technologies, etc. It created independently the finite element method during the early 1960's and formulated the theoretical foundation for this method. In recent years, it has obtained several major achievements in completing adjustment calculations for China's astronomical and geodesic network, theoretical research on nonlinear wave solutions, research on viscous and nonviscous flow, normalization and nonnormalization and calculations of the fluid mechanics of supersonic flow and transonic flow, research on numerical methods in seismic prospecting, research on ordinary differential equations, research on numerical algebra methods, research on numerical approximation, research on computer geometry, research on probability and statistics calculations, research on optimized calculations, and other areas. Some of the achievements have been written into software and extended for use outside the center. They also have completed automation, drafting and other types of software for enterprises and offices and development of mathematics software banks. The Computing Center has five large, medium, and small computers open to the outside.

The Computing Center now has 450 employees. Structural reforms were carried out during May 1984 and the research office system was eliminated while three departments were established. The first department involves development and maintenance of computers and network systems and service to the outside. The second department is developing research on applied software and systems software. The third department does research on computer applications in science.

Director: Feng Kang [7458 1660]

Party secretary: Liu Lianru [0491 1670 0320]

Academic Committee chairman: Feng Kang

Address: Zhongguancun, Beijing

Telephone: 283585

Institute of Engineering Thermophysics

The Institute of Engineering Thermophysics was established in 1980. It formerly was the Motive Power Research Office and was combined with the Institute of Mechanics in 1960.

The Institute of Engineering Thermophysics focuses on basic research in aviation, navigation, and industrial gas turbine thermophysics, and it is engaged actively in development of research on the thermophysics of energy utilization to provide a scientific foundation for designing high efficiency heat engines and effective energy utilization. It now has research offices for engineering thermodynamics, impeller aerodynamic thermodynamics, heat engine aerodynamic thermodynamics, heat transfer and mass transfer, combustion, and other areas as well as experimental equipment, measurement, and computer technology offices.

In the past 20-plus years, the institute has made major achievements in development of impeller ternary flow theories and their application. In addition, it also has made important achievements in research on gas turbine superchargers, gas membrane cooling, heat pipes, and other areas. Moreover, it set up 250 kw and 850 kw centrifugal gas compressors, 3,000 kw axial flow compressors, gas membrane cooling, heat tubes, high vacuum ignition, cool and heated state fluidization, coal water mixture gas burning turbine combustion chambers, water pumps, and other experimental facilities, and studied the use of laser speed measurement technologies and data collection and processing systems in high-speed rotary machinery. Recently it also developed applied research in the areas of combined gas-steam cycling, joint supply of electricity and heat, utilization of industrial waste heat and energy conservation technologies. Furthermore, it has established the Zhonghua Gas Turbine Research and Development Co. in conjunction with the Hongqi Machinery Plant in Xi'an and is carrying out the related development work.

Director: Wu Zhonghua [0702 0112 5478]

Party secretary: [blank]

Address: No A-3, Zhongguancunlu, Beijing

Telex: 3582

Telephone: 285919

The Variable Speed Constant Frequency Wind Power Generator

The variable speed constant frequency wind power generator is a type of inexpensive, high-efficiency equipment for the conversion of wind energy into electrical energy. It includes a structurally unique flat axial propeller and a variable speed constant frequency electrical generator system. This generator developed by the CAS Institute of Electrical Engineering generates 3.4 kw of electricity at a wind speed of 10 meters per second, and it has attained advanced international levels and provides convenient and cheap energy resources for frontier regions in China.

Space Science and Technology Center

The Space Science and Technology Center was established in February 1979. It now has 413 employees including 272 S&T personnel (16 advanced research technical personnel and 123 middle-level personnel).

The Space Science and Technology Center now has the Nos 1, 2, 3, 4, and 5 Propulsion Research Offices, a library and information research office, and other professional organizations. Its primary tasks are to import continental satellite ground station systems and to take responsibility for their construction, operation, and management; to develop basic research on computer imaging and processing methods, design and manufacture of image processing equipment, and applied research in remote sensing; and to develop research on measurement and control of the atmosphere and recovery techniques for upper air science.

Since its establishment, the center has published more than 40 articles in Chinese and foreign periodicals. The main scientific research achievements include: the SIPS-1 Image Processing System, the MOP-2A Pulse Plasma Micro-thruster, the CMY-8 Pulse Energy Storage Capacitor for use in a vacuum environment, false image synthesis and black and white intensification technologies for image processing, flying spot scanning input/output equipment, etc.

Director: Wang Daheng [3769 1129 3801] (concurrent)

Party secretary: Wu Jie [0702 2212]

Academic Committee chairman: Wang Daheng (temporary)

Address: Xiwudaokou, Haidian Qu, Beijing

Telex: 7035

Telephone: 285776

Remote Sensing Technologies

Remote sensing involves the installation of remote sensing equipment on aircraft, satellites or spacecraft to collect the visible light, laser light, infrared lines, microwaves and other electromagnetic waves coming from the Earth and its atmosphere, and to use film, electric communications transmission type digital magnetic tape and other recording forms to transfer them into the hands of people who then use image processing to derive a wide range of accurate information.

In recent years, we have developed visible light, infrared to microwave, and other types of remote sensing equipment and carried out aerial remote sensing experiments for Hami in Xinjiang, Tengchong in Yunnan, Zhengyutan in Changchun, Bohai Gulf in Tianjian, Dukou-Ertan in Sichuan and the Tai Hu region [Jiangsu]. Obvious socioeconomic benefits have been obtained in related spheres of the national economy.

Institute of Electronics

Preparation for construction of the Institute of Electronics was begun in 1956. After 1967, it was under the jurisdiction of the National Defense Science Commission and was returned to the CAS in 1975. Since 1977, it has rebuilt research work in radio, electromagnetic fields and other branch disciplines and became a comprehensive electronics research institute. It now has, 1,144 employees including 691 S&T personnel (36 advanced S&T personnel and 558 middle-level people).

The scientific research tasks of this institute at present are: 1) research on information circuits and systems, mainly involving information theories, signal transmission, communications and television technologies, image and data processing, microwave remote sensing, and other areas; 2) electromagnetic field theory and applications, mainly involving research on antenna theories, theories of wave motion in plasma, and research on electromagnetic field scattering and on theories and applications of its inversion; 3) research on electron physics and electronic components, mainly involving electron radiation, electron optics, microwave (including millimeter waves and submillimeter waves) components, microwave integrated circuits, and low-temperature superconductor electronics; 4) research on lasers and optoelectronics, mainly involving research on new types of gas lasers and their applications, research on photoemission and radiation, photoconductive materials, and photoelectric image formation technologies. In the area of comprehensive utilization, it also has developed research on electronic materials and techniques and on biomedical electronics.

The institute has made more than 270 S&T achievements since it was founded, the main ones being projects in such areas as lasers, millimeter wave instruments, space traveling-wave tubes, electron optics, high-resolution television systems, and synthetic aperture side-looking radar systems. From 1980 to 1983, it published 441 articles in Chinese periodicals and 35 articles in foreign periodicals.

Director: Chai Zhengming [2693 2182 2494]

Party secretary: Zhang Yiyi [1728 5065 5065]

Academic Committee chairman: Lu Baowei [0712 0202 4850]

Address: Zhongguancun, Beijing

Telex: 4888

Telephone: 281814

Institute of Semiconductors

The predecessor of the Institute of Semiconductors was the CAS Institute of Physics Semiconductor Research Office. It was moved out of the Institute of Physics in 1960, and was established as the Institute of Semiconductors. At the end of 1983, it had a total of 1,430 employees, with 673 S&T personnel including 29 advanced S&T personnel and 541 middle S&T personnel. It has set up a semiconductor materials office, a new circuits and new components office, a new techniques and new technologies office, a surface components office, a microwave component office, an instrument and equipment office, a photoelectric instrument office, a physiochemical analysis office, an ultra-pure line for large-scale integrated circuits, a computer station, a semiconductor physics department, a library, a metallurgical plant, a corridor plant, a power station, and other research offices and auxiliary facilities.

The Institute of Semiconductors is a comprehensive research institute. In the 24 years since its establishment, it has carried out a variety of research activities in such areas as semiconductor physics, semiconductor materials, transistors, integrated circuits, photoelectronic components, microwave components, semiconductor testing instruments and equipment, etc. In the future, it will concentrate on applied research and technical development work and focus on semiconductor physics and other related basic research, on intensive development of research on semiconductor physics, materials, components and integrated circuits, explore new phenomena, new effects and new theories in semiconductors, and study and develop new materials, new techniques, new components, and new circuits and their application.

Since its establishment, the institute has made nearly 500 S&T achievements including about 100 important achievements. Some representative ones include: theoretical research on GaAs monocrystalline materials, silicon plane techniques and silicon plane transistors, silicon solar batteries, semiconductor thermal refrigeration, microwave beacons, millimeter wave mixers and oscillators, semiconductor laser components, multivariate logic circuits, MOS field effect tubes, etc., 4K and 16K MOS random storage devices and on nonradiative transition adiabatic approximation and steady-state coupling. In addition, it also has created an integrated circuit graphics generator, large-scale integrated circuit storage device testers, logic analyzers, and other important instruments and equipment.

Honorary director: Huang Kun [7806 2492]

Director: Wang Shoujue [3769 1343 6030]

Party secretary: Li Weixue [2621 4850 1331]

Academic Committee chairman: Lin Lanying [2651 5695 5391]

Address: No 9, Daqudeng Hutong, Dongcheng Qu, Beijing

Telex: 2331

Telephone: 442331 (central switchboard); 440893 (offices)

Institute of Automation

The Institute of Automation was established in 1956. The main forces then came mainly from the Automation Research Office of the Changchun Institute of Electronics.

System changes in 1967 placed the institute under the National Defense Science Commission and in 1970 two of its research offices formed the basis for the reorganization of the CAS Institute of Automation. The main orientation of the institute is toward civilian automatic control system technologies. In 1980, the institute established two departments responsible for satellite attitude control. In 1984 its astronomical and satellite tasks changed and the second department of the Institute of Automation was closed. There are a total of 575 people in the institute, including 331 S&T personnel (over 30 advanced researchers and 200 middle-level personnel). The main research orientation of the institute at present is toward systems and control, intelligent automation, machine and electronic technologies, and auxiliary design of computers.

Since its establishment, the institute has made more than 150 achievements in such areas as automation theory and control systems, sensor and actuating mechanism structures, computer control of the production process, remote measurement and remote control, etc. Over 40 of them were major S&T achievements, some representative ones being a 60 cm astronomical telescope control system, the J-331 giant electronic modeling computer, computer control of the chemical fertilizer production process in Lanzhou, the DJS-C4 general purpose digital processing computer, high-speed light pen graphics display equipment, handwriting digital recognition technologies, model recognition experiment systems, computer diagnosis systems for Chinese medicine, artificial intelligence expert advisory systems for petroleum test wells, electron beam image dissection/recording technologies, the TF-KSI multifunction graphics generator, centralized control systems for the tower at the Beijing International Airport, etc.

The institute publishes ZIDONGHUA XUEBAO [AUTOMATION JOURNAL] and the restricted publication ZIDONGHUA [AUTOMATION].

Director: Hu Qiheng [5170 0796 1854]

Party secretary: Xu Qinian [1776 6386 1628]

Academic Committee chairman: Shu Songgui [3990 2646 2710]

Address: Zhongguancun, Beijing

Telex: 5261

Telephone: 281575 (office)

Institute of Electrical Engineering

Construction of the Institute of Electrical Engineering was begun in 1958 in Beijing on the basis of some of the research offices in the former CAS Changchun Institute of Electromechanics, and it was established formally in 1963. It has more than 620 employees, including more than 400 S&T personnel (35 advanced S&T personnel and over 200 middle-level S&T personnel). It admits more than 10 graduate students each year. It has nine research offices and one subsidiary processing plant. The nine research offices are a magnetohydrodynamic power generation research office, a special electric machine research office, a high voltage pulse discharge technology research office, a superconductor technology research office, a computer technology research office, an electronic processing technology research office, a microelectric beam technology research office and a library and information research office.

The institute is engaged primarily in research on basic theories of applications of electrical engineering and electricity and on new technologies. The content of the research includes: electromagnetic field theories, superconductor electrical engineering technologies, microelectron beam exposure technologies, special and microelectrical machines, electrical processing technologies, and computer applications in the realm of electrical engineering.

Since its establishment, the institute has made more than 200 scientific research achievements, the main ones being electrical spark seismic sources for oceanic petroleum exploration, the PHS-120 flat electric machine automated drafting machine, electric spark processing of machine tools, photoelectric tracking and numerically-controlled wire electrode electrical processing equipment, electron beam welders, wide speed regulating DC servo electric machines, 10,000 kiloAmp evaporation cooled water turbine electric machines, variable speed constant frequency wind power electricity generators, single fracture polar-type permanent magnet stepping motors for quartz used in wristwatches, linear electric machine accelerators, 30-point contactless remote temperature measurement equipment, electric arc heaters, electric arc direct ignition for boiler coal powder, precision DC superconducting magnet systems for use in astronomical telescopes, 20 million joule ordinary temperature inductive energy storage equipment, automatic programming of linear electric machine processing of machine tools, color differentiators with microprocessors, the achievement of 595 kw short and 33 kw long-term power generation output and 1,500°C warm air temperatures using oil-burning magnetic fluids for power generation, etc.

Director: Yang Changqi [2799 2490 3825]

Party secretary: Cheng Yulin [4453 3768 2651]

Academic Committee chairman: Han Shuo [7281 2592]

Address: Zhongguancun, Beijing

Telex: 9060

Telephone: 281545 (office)

Institute of Systems Science

The Institute of Systems Science formerly was a part of the CAS Institute of Mathematics and was established formally in October 1979.

The institute is engaged in research on control theory, comprehensive research on large systems and on basic theoretical research work in the marginal disciplines of mathematics. It currently has seven research offices engaged in control systems theory, system identification, information theory and information processing, operations research, systems management, mechanical identification, topology, mathematical physics, applied functional analysis, and other research.

The main research achievements include rational and embedded theories in topology, the discovery of a nonhomotopic invariant topological invariant, mechanization of Euclidean geometry and differential geometric identification, generalized function multiplication methods, intermittent differential equations, comprehensive quality management, sample acceptance, the study, formulation and extension of reliability standards, research and extension of input/output methods in planned management of the national economy and in enterprise planned management, successful theoretical results in the true distribution and asymptotic expansion of empirical functions, experiment design and parameter estimation, the application of orthogonal design, coding theory, proposing the first smallest arborescence method in the world and developing it into quantitative optimum base calculation methods restricted to two quasi-array exchanges, nonlinear planning theories, some special function space theories and their application in mathematical physics, nonlinear operator equation approximation methods, the nature of neutron migration operation spectra, the earliest (1956) proposal of the monotone operator concept in the world, linear control theories, elastic vibration control theories, theories on the controllability and visibility of randomness, applications of minimum variance for recursive filters in space, aviation and navigation, applications of modern control theories in space and other areas, etc.

Honorary director: Wu Wenjun [0702 2429 0193]

Director: Cheng Ping [2052 1627]

Party secretary: [blank]

Academic Committee chairman: Ding Xiaqi [0002 1115 3971]

Address: Zhongguancun, Beijing

Telex: 4762

Telephone: 283063

Institute of Remote Sensing Applications

The Institute of Remote Sensing Applications was founded on the basis of the former Aviation Image Interpretation Research Office and the Drafting Automation Group of the CAS. The institute was established formally in 1980. In March 1983, the Chinese National Remote Sensing Center Development Department was established within the institute. The institute has 223 employees, including 5 advanced S&T research personnel and 68 research assistants and engineers.

The institute is engaged mainly in research on the theories, techniques, and methods of comprehensive applications of remote sensing technologies in geology, biology, the environmental sciences and other disciplines, in developing basic and applied research on aviation remote sensing and satellite remote sensing technologies and in research concerning the theoretical methods and applications of computerized remote sensing image processing. The institute has established six research offices engaged in experimental research on geophysical spectra, computerized remote sensing image processing, image interpretation and analysis, computer-aided drafting, and environmental information systems, and aviation remote sensing. It also has set up laboratories for computer image processing, photographic processing, published information, etc.

Since its establishment, the institute has organized widespread cooperation with various units within and outside the institute and successfully developed pulse resource remote sensing, development of hydropower at Ertan, the environment of Tianjin Municipality and other comprehensive aerial remote sensing experiments, and it gained a great deal of information on geophysical spectra, aerial remote sensing images and data, and attained applied research results in many areas. It is responsible for comprehensive design for the development of automated drafting equipment and it has organized and completed development of electron color separation scanning image processing. It participated in development of hand-carried tracking digitizers, numerically controlled drafting machines, and automatic map typesetters. It developed microcomputer-aided drafting and man-machine interactive drafting systems, developed many types of image processing and drafting software, and completed in a preliminary fashion the establishment and experimental utilization of regional environmental information systems.

Director: Yang Shiren [2799 0013 0088]

Party secretary: Yang Guangzhen [2799 1639 6591]

Academic Committee chairman: Yang Shiren

Address: No 917, Datunlu, Deshengmenwai, Beijing

Telex: 6674

Telephone: 446551-657

Institute of Space Physics

The Institute of Space Physics during its early period was Group 581 of the CAS founded in 1958. Its name was changed to the CAS Institute of Applied Geophysics in 1966. After 1967, it was placed first under the National Defense Science Commission and then under the Seventh Ministry of Machine Industry. It was returned to the CAS in November 1978 and named the CAS Institute of Space Physics.

The institute is involved mainly in research on middle and upper atmospheric physics, upper atmospheric spectral physics, ionospheric physics, magnetospheric physics, cosmic ray physics, and heliospheric and interplanetary physics. It uses high vacuum stratospheric balloons, sounding rockets, artificial earth satellites and surface monitoring equipment to carry out coordinate sounding, clarify the process and basic nature of certain physical phenomena that occur in space and study the transmission and coupling of the material and energy of solar-terrestrial space to provide basic data on the space environment for China's space activities. The institute's scientific research tasks in the past few years have involved development of research on solar-terrestrial systems with a focus on near-earth space research. It has developed sounding rockets, surface monitoring equipment and other measures, and it has made full use of China's stratospheric balloons and satellite measures to engage in basic and innovative research work. They are developing sounding instrument technologies for all realms of the branch disciplines of space physics and carrying out research on navigation, orbital measurement, information transmission, and the coupling process between the solar wind, magnetosphere, ionosphere, and middle and upper atmosphere.

Since its establishment, the institute has made more than 70 research achievements and submitted nearly 600 theoretical research and applied theoretical research articles and reports. The major achievements are the 3 sounders, the T₇ sounding rocket sounding system, 651 single frequency Doppler receiving equipment, the 651 beacon and the "Shixian [Experimental] 1" scientific satellite, the "718" [July 18] meridian instrument decoder, manmade satellite environment handbooks, theories on the origin of the global and planetary atmospheres, etc.

Director: [blank]

Party secretary: [blank]

Academic Committee chairman: Lu Baowei [0712 0202 4850]

Address: Xiaoni Lane, Yongfeng Commune, Haidian Qu, Beijing

Telex: [blank]

Telephone: 287461

Institute of History of Natural Sciences

The Institute of History of Natural Sciences was established in 1975 on the basis of the former Chinese History of Natural Sciences Research Office. As early as 1954, the CAS had established the Chinese History of Natural Sciences Research Committee and in 1957 it established the independent Chinese History of Natural Sciences Research Office. It now has a recent and modern S&T history office and five research offices for the general history of S&T in China, the history of ancient mathematics and astronomy, the history of ancient biology and earth science, the history of ancient physics and chemistry, and the history of ancient technology. It has a total of 124 employees including 60 research personnel (4 research personnel and 13 associate research personnel, and 37 assistant research personnel).

At present, the institute is engaged primarily in research on the history of S&T in China and the history of recent and modern S&T. Since its establishment, the institute has made rather influential achievements in historical records of supernovas, time compilations from the Zeng Houyi tombs of the Warring States period, ancient papermaking technologies, and other areas. They have compiled and published the ZHONGGUO KEXUE JISHU SHIGAO [OUTLINE HISTORY OF SCIENCE AND TECHNOLOGY IN CHINA], the ZHONGGUO SHUXUE SHI [HISTORY OF MATHEMATICS IN CHINA], the ZHONGGUO TIANWENXUE SHI [HISTORY OF ASTRONOMY IN CHINA], the ZHONGGUO GUDAI ZAOZHI JISHU SHIGAO [OUTLINE HISTORY OF ANCIENT PAPERMAKING TECHNOLOGIES IN CHINA], XU GUANGQI JINIAN WENJI [COLLECTION OF COMMEMORATIVE ARTICLES BY XU GUANGQI [1776 0342 0796]], SONGYUAN SHUXUE SHILUN WENJI [COLLECTION OF HISTORICAL TREATISES BY SONG YUAN [1345 0337] ON THE HISTORY OF MATHEMATICS], and other important works. The institute publishes the two quarterlies ZIRAN KEXUE SHI YANJIU [RESEARCH ON THE HISTORY OF NATURAL SCIENCE] and KEXUE SHI YICONG [TRANSLATIONS ON THE HISTORY OF SCIENCE], and the irregular publications KEXUE SHI JIKAN [COLLECTED PAPERS ON THE HISTORY OF SCIENCE] and KEJI SHI WENJI [COLLECTED ARTICLES ON THE HISTORY OF SCIENCE AND TECHNOLOGY]. The institute has written and published ZHONGGUO GUDAI KEXUEJIA [SCIENTISTS OF ANCIENT CHINA], ZHONGGUO GUDAI KEJI CHENGJIU [SCIENTIFIC AND TECHNOLOGICAL ACCOMPLISHMENTS OF ANCIENT CHINA] (in Chinese and English editions), KEXUE JISHU DE FAZHAN [THE DEVELOPMENT OF SCIENCE AND TECHNOLOGY], and other scientific popularization works of wide influence. Furthermore, important works like ZHONGGUO DILIXUE SHI [HISTORY OF GEOGRAPHY IN CHINA], ZHONGGUO JIANZHU JISHU SHI [HISTORY OF CONSTRUCTION TECHNOLOGIES IN CHINA] (Chinese and English editions), ERSHI SHIJI KEXUE JISHU JIANSHI [A CONCISE HISTORY OF SCIENCE AND TECHNOLOGY IN THE 20TH CENTURY], and others now are in the process of being printed.

Director: Xi Zezong [1598 3419 1350]

Party secretary: Meng Fanshun [1322 4907 7311]

Address: 1 West Gongyuan Street, Beijing

Telephone: 551176

Management Cadre Academy

The predecessor of the Management Cadre Academy was the CAS Cadre Training Academy that began construction in September 1978 and was at that time the CAS Cadre School. It was changed in March 1980 to the CAS Cadre Training Academy. In March 1983 a conference chaired jointly by the president of the CAS and the CAS Party Group decided to establish the CAS Management Cadre Academy on the foundation of the former Cadre Training Academy. It was agreed upon after examination and approval by administrative departments in Beijing Municipality.

The CAS Management Cadre Academy focuses on training employed cadres. The focus is management of scientific research and adherence to the principles of integrating long- and short-term study systems, integrating education and scientific research, integrating professors with specialized appointments and concurrent appointments, and integrating the school with institutes. Under guidance by Marxism and Mao Zedong Thought, they explore basic theories, systems and methods for implementation of modern scientific management in China's scientific research departments and efforts to transform it into a foundation for CAS training of management personnel and for carrying out research on management theories.

The academy now has a political system, a scientific management system, six specialized educational research offices, and four laboratories. The academy has 230 employees and has begun to establish an educational staff of 213 that integrates specialized appointments and concurrent, with 54 specialized professional appointments including 2 associate professors, 10 lecturers, 26 assistant professors, 2 associate engineers, and 14 teachers. It had trained 2,586 cadres of various types up to the end of 1984.

To achieve multilayer and more effective training of management personnel, besides the existing special program students and short-term training classes, the academy now is active in creating the conditions to admit undergraduate and graduate students. The plan is to expand the staff at the academy to a scale of 1,000 people by the year 1990.

Director: Gu Yijian [7357 0110 0256]

Party secretary: [blank]

Address: Huaibei Village, Huairou County, Beijing

Telephone: 335031-98202

Scientific Instruments Factory

The Scientific Instruments Factory was established in 1958, turned over to the National Defense Science Commission in 1968, and returned later to the Seventh Ministry of Machine Building Fifth Academy. In 1970 the CAS reestablished the Scientific Instruments Factory and reinstated its former name. In 1972, the Scientific Instruments Factory was placed under dual leadership by Beijing Municipality and the CAS with primary leadership by Beijing Municipality, and its name was changed to the CAS Beijing Scientific Instruments Factory. It was changed to CAS leadership in 1977. It now has 805 employees, 317 technical personnel, 402 technical workers, and 84 cadres.

The plant focuses on development and production of electronic optical instruments and mass spectrometers, and it also has engaged in applied development and production of electronic technologies and vacuum technologies related to instruments, including data processing.

Products that have received CAS and national awards over the years are: 10 ZHP-2 solid double focus mass spectrometers, the ZHP-4G ultrasensitive helium mass spectrometer leak detector and a small portable leak detector, 66 gas chromatographs, the DX-3 scanning electron microscope, the ZHP-3 small mass spectrometer, an electron beam screen display, a superhigh vacuum oilless generator digital integrator, the SD-1 digital printer, a turbomolecular pump, chromatic spectrum mass spectrometers and computer interfaces, the LT-1 ion probe mass spectrum microanalyzer, the X-3F dual channel X-ray spectrometer, the DX-4 transmission electron microscope, the DX-5 scanning electron microscope, a flying time mass spectrometer, and an atomic probe mass spectrometer.

Manager: Wu Zuoli [0702 0155 4409]

Party secretary: Wang Yi [3769 3015]

Technical Committee chairman: Xiang Pengju [0686 7720 5282]

Address: Zhongguancun, Beijing

Telex: 4652

Telephone: 281829

Factory 109

Factory 109 was established in 1958 and was one of the first semiconductor component plants in China. It later was placed under jurisdiction of the CAS Institute of Applied Physics and Institute of Semiconductors and in 1964 became the Semiconductor Components Factory under direct jurisdiction of the CAS. It is engaged primarily in development work for large integrated circuit production technologies.

Shortly after the plant was built, it was the first to engage in trial manufacture of various types of germanium diodes, rectifiers and triodes, and it supplied the main semiconductor components for China's first transistor computer. In 1964 it began trial production of silicon plane transistors and afterward developed thin membrane and single wafer integrated circuits, and it supplied matched sets of integrated circuits for China's first integrated circuit computer. During the 1970's, the plant developed and produced over 100 types of integrated circuits (e.g., TTL, ECL, STTL, LTTL, and other product lines), including six development achievements that received awards from the National Science Conference in 1978. Most of the integrated circuits in China's first large-scale vector computer (the 757) were developed and produced specially by this plant.

Factory 109 now has 784 employees, including 230 technical personnel (9 advanced engineers). Since becoming the key unit for national development of integrated circuit technologies in 1978, it has imported more than 100 advanced technologies, inspection and physiochemical analysis equipment, and built a new modernized clean plant building. In addition, it also has carried out technical transformation of its original production lines and established bipolar medium and small-scale integrated circuit standard technologies and formed the ability to produce 1 million integrated circuits each year. It now is engaged in development work for computer-aided design (CAD) and is accelerating the development of new products. After the new plant building goes into operation, it gradually will form the capability of producing several million large-scale integrated circuits each year.

Manager: Wang Shouwu [3769 1343 2976]

Party secretary: Deng Biao [6772 1753]

Technical Committee chairman: Wang Shouwu

Address: Qijiahuozi, Deshengmenwai, Beijing

Telephone: 447098

Cryogenic Technology Test Center

The Cryogenic Technology Test Center was formed in January 1980 by combining the cryogenic technology research sections of the former Institute of Physics and the cryogenic technology sections of the former Gas Factory, and it was formally named the Cryogenic Technology Test Center in 1982.

The center is oriented toward all of China and does basic and experimental research on cryogenic technologies, research and development of new types of cryogenic equipment and technical service work for cryogenic experiments. Its primary goals are to use applied R&D work to promote the development of cryogenic technologies and applications in liquid helium temperature zones in China, especially in promoting the utilization of superconductor technologies, and to provide good technical equipment that integrates laboratory and industrial applications. The technical services provided by the center include development tasks and technical advice for cooling equipment and cooling systems for liquid helium temperature zones, providing the conditions for liquid helium and other cryogenic experiments, providing storage containers for liquid nitrogen and liquid helium as well as storage systems for liquid helium metal experiments and liquid transmission pipes, liquid level indicators and other matching equipment, receiving information on cryogenic thermodynamics and dynamic properties, standards for cryogenic thermometers and other work, and opening to the public cryogenic laboratories for units without cryogenic conditions.

The more important achievements in the center before and after its establishment include hydrogen and helium liquefaction equipment, helium piston expansion machines, helium turbine expansion machines, helium refrigerators used in space modeling equipment, GM refrigerators for use in satellite communications stations, dual level piston expansion machine helium liquefiers, static pressure and dynamic pressure gas bearings for small-scale helium turbines, 100-liter liquid nitrogen and liquid helium storage containers, metallic liquid helium experimental storage systems, research on the properties of the Chinese-made RS-11 solid carbon core resistor thermometer and so on, and some of the achievements already have been produced in small amounts and provided to users.

Director: Hong Chaosheng [3163 2600 3932]

Party secretary: [blank]

Academic Committee chairman: Hong Chaosheng

Address: Zhongguancun, Beijing

Telex: 1143

Telephone: 284153

Science Press

The Science Press was established in 1954.

It now has seven publication editing offices, four periodical editing departments, and one periodical office, and it has established several professional units including an office, a planning office, a central publishing office, an editorial research office, a foreign affairs office, and other professional organizations and publishing departments; a binding and layout design office, a distribution office, a technology office, an information office, etc. It established the Science Bookstore on Chaonei Dajie in Beijing.

The publications issued by the Science Press include: 1) special works on scientific achievements; 2) applied technologies and experimental technologies; 3) basic state scientific information; 4) readers on basic theories in the natural sciences; 5) collections of articles; 6) comprehensive evaluations; 7) scientific and technical glossaries and dictionary working tools; 8) histories of science and technology and management science; and 9) scientific popularization readers. In addition, it also publishes various journals and special magazines and a small number of scientific popularization periodicals in the natural sciences.

The Science Press has published a total of 8,787 types of books since its establishment (not including the period from 1966 to 1970). In 1983 it published 579 types of printed material and 537 issues of 93 types of periodicals. The maximum number of periodicals published during a particular year was 108 types.

Editing and publishing work has developed rather quickly in recent years and it has received good evaluations from readers within China and abroad. In the first instance of evaluation and selection activities for superior S&T books in China in 1982 and the second in 1983, 15 works published by the Science Press including ZHI FENBU LUN JI QI XIN YANJIU [THE DISTRIBUTION OF VALUE AND NEW RESEARCH ON IT], ZHONGGUO ZHIWU ZHI [ACTA BOTANICA SINICA], FENGBAO CHAODAO LUN [WINDSTORM TIDE CONDUCTION], GUANGTANXING YUANLI JI QI CESHI JISHU [PRINCIPLES OF PHOTOELASTICITY AND ITS MEASUREMENT TECHNIQUES], SHUDIAN XITONG DE ZUIYOU KONGZHI [POWER TRANSMISSION SYSTEMS AND OPTIMUM CONTROL], and others received first and second place awards, the most of any publishing house.

The Science Press began cooperative publishing work with foreign countries in 1979 and it has signed agreements with publishing companies in England, the United States, Sweden, West Germany, Japan, Holland, the Philippines and the Hong Kong region and it has published more than 100 types of books cooperatively. Its services in this area are continuing to develop.

Director: Zhang Lizheng [1728 4539 2398]
Party secretary: Xia Hongfa [1115 7703 4099]
Chief editor: Zhang Lizheng
Address: 137 Chaonei Dajie, Beijing
Telex: 4411
Telephone: 444036

CAS Library

The CAS Library was established in 1951.

It currently holds 4.86 million volumes (pieces) of printed information, mainly in the natural sciences and new technologies as well as some books in the social sciences. These include nearly 30,000 types of periodicals in about 2.67 million editions, about 800,000 books, about 460,000 ancient string-bound works, and about 930,000 volumes (pieces) of various types of scientific and technical reports. About 100,000 publications are added to the collection each year.

It now has 432 employees, about 40 percent of whom are advanced professional personnel. It has set up nine professional departments: a visitor's department, catalog department, social science service department, natural science service department, document and news report department, scientific information research office, research assistance department, editorial and publishing department, and technical services department.

The CAS Library is China's printed information center. It is responsible for the collection, processing, study, and provision of scientific and technical news reports and information and for carrying out professional guidance of printed information work in the academy and institutes. It has practiced long-term adherence to the principle of focusing on the CAS in combination with units outside the academy and on providing all types of services to S&T research and economic construction, developing borrowing and reading exchanges, reprinting of news reports, reference advice and news report searches, catalog reports and extension of propaganda, information research, editing, translating and publishing, and other types of service work. Nearly 30,000 lending cards have been issued in recent years and it receives more than 200,000 readers each year, loans out more than 500,000 volumes, provides 1.6 million pieces of printed information, provides answers and advice more than 20,000 times and edits more than 10 types of books. Since 1977, the newly-established information research office has provided nearly 300 items of reference materials in the areas of scientific research planning, scientific research management and disciplinary trends to the state, the CAS, and S&T leadership departments at all levels.

The CAS Library has set up printed material exchange relationships and carried out scientific and cultural exchange activities with more than 1,400 scientific research organs and institutions of higher education in 82 countries and regions. The library also publishes KEJIU GUANLI [SCIENTIFIC RESEARCH MANAGEMENT], TUSHU QINGBAO GONGZUO [PRINTED INFORMATION WORK], and other scholarly publications that are distributed openly within and outside of China.

Director: Tong Cenggong [0157 2582 0501]
Party secretary: [blank]
Address: 27 Wangfujing Dajie, Beijing
Telex: 5290
Telephone: 553052

News and Magazine Service of the Dialectics of Nature

The News and Magazine Service of the Dialectics of Nature was established in 1978.

This office is engaged mainly in editing and publishing the magazine ZIRAN BIANZHENGFA TONGXUN [JOURNAL OF DIALECTICS OF NATURE]. This is a comprehensive and theoretical magazine that deals with the philosophy, history, and sociology of the natural sciences. Under guidance by Marxism, the magazine strives to promote integration of the natural and social sciences and mainly explores philosophical questions and methodology in the natural sciences, the mutual influences of S&T and society and S&T policies, the history of science and technology (with an emphasis on recent and modern history of S&T and the social history of S&T), and it introduces related scholarly trends and forward positions in modern science. The office also edits and publishes the informational publication KEXUE YU ZHEXUE [SCIENCE AND PHILOSOPHY] that deals with research progress in foreign countries related to natural dialectics, the philosophy of science, the history of S&T, and scientific sociology. It also translates and publishes KEXUE DUI SHEHUI DE YINGXIANG [THE INFLUENCE OF SCIENCE ON SOCIETY] (Chinese edition) that is edited by UNESCO.

Since its establishment, the office has organized and convened or worked with related units for jointly convening several scholarly conferences related to natural dialectics, the philosophy of science, scientific sociology, S&T policy, the social history of science and newly emerging disciplines in the natural sciences. It also edited the related collections of articles like KEXUE CHUANTONG YU WENHUA--ZHONGGUO JINDAI KEXUE LUOHUO DE YUANYIN [SCIENTIFIC TRADITION AND CULTURE--THE REASONS FOR CHINA'S SCIENTIFIC BACKWARDNESS IN THE RECENT ERA], etc.

Director: [blank]

Editor: Yu Guangyuan [0060 0342 6678]

Party secretary: Wang Di [3769 6611]

Address: Unit 20, Northwest District, Friendship Hotel, Beijing

Telex: 6589

Telephone: 895967

The Multibeam Fishing Sonar

The model 761 multibeam sonar fish detector developed by the CAS Institute of Acoustics can explore a broad area over long distances. It is hard to miss targets and can reveal visually the location, distance, and size of fish schools, which can improve production levels substantially in China's oceanic fishing purse nets. Yearly output in the Shanghai Oceanic Fishing

Co. rose 1.66-fold when using the 761 fish finder. At the end of 1982, the company's number 387 trawler caught about 1.2 million jin of fish in one netting and had to release a portion of them because the net could not hold them, but this netting still yielded 900,000 jin.

Graduate School, China University of Science and Technology

The Graduate School of the China University of Science and Technology was founded in Beijing in September 1977. The first class of graduate students was admitted formally in October 1978.

The graduate school is integrated with various institutes in the Beijing region and trains Master's and Doctoral students. The graduate school is responsible mainly for educational work and enrollment management work for the publicly required courses, basic theory courses and practical courses of graduate students, and it is responsible for political and ideological work for the graduate students during this period. To date it has admitted 6 classes of graduate students totaling 2,632, including 10 who have received Doctoral degrees and 760 who have received Master's degrees.

The teaching staff of the graduate school is composed of two groups, special appointments (professors of the college) and concurrent appointments (research personnel from institutes in the Beijing area). In addition, it also invites famous scholars from China and abroad to organize various types of scholarly exchange activities focused on education.

The Academic Committee composed of scientists from all the institutes and professors and associate professors of the school is the highest advisory body for the academic profession in the school. The school has established six teaching departments in the areas of mathematics, physics, chemistry, biology, earth science, radio and electronics, and computer sciences. Director and deputy director positions in the educational departments are held by scientists from the related institutes and each teaching department is integrated with the relevant educational and research offices to take responsibility for educational work related to organizing and guiding graduate students.

President: Yan Jici [0917 3444 1964] (concurrent)

Party secretary: Zhang Motang [1728 5459 2768]

Academic Committee chairman: Ma Dayou [7456 1129 3731]

Address: A-19, Yuquanlu, Beijing

Telex: 4496

Telephone: 810831

Printing House of the Chinese Academy of Sciences

The Printing House of the CAS was established in 1957. It was combined with the Chinese People's Volunteers Political Ministry Printing House in 1958. It now has 938 employees and 4 basic production workshops: composing, letterpress, offset, and binding. There is one auxiliary workshop responsible for machinery repair, electrical work, and woodworking.

The task of the printing house is to provide scientific research publishing services, and its primary responsibility is to print the S&T books and periodicals published by the Science Press.

During interhouse competition developed with colleagues in Beijing Municipality, the printing house was evaluated as a Red Flag Unit eight times. It was one of 10 Red Flag Units in the national printing industry at the National Congress of Advanced Collectives and Advanced Individuals in Book Publishing convened by the State Publishing Bureau in 1980. It was evaluated as an advanced unit during national "Quality Month" activities organized by the Beijing Municipal Printing Co. in 1982 and 1983.

The house currently is carrying out technical transformation in a planned way and is moving from manual composing and production techniques to the development of electronic composing, high-speed printing, and modernized enterprise management.

Directro: Zhou Xun [0719 8113]

Party secretary: [blank]

Address: Beiyuan, Tongxian County, Beijing

Telex: 8922

Telephone: Beijing long distance station "118" extension 9522798

The Lanzhou Heavy Ion Accelerator National Laboratory

The Lanzhou Heavy Ion Accelerator is an accelerator that uses rather heavy ion beam flows to impact upon an experimental target. This is an important measure for research on collective motion of nuclear material, the structure of atomic nuclei and reaction mechanisms. It has broad prospects for use in atomic physics, solid physics, materials, radiation biology, and other fields.

The Lanzhou Heavy Ion Accelerator Project, construction of which was the responsibility of the CAS Institute of Modern Physics in Lanzhou, is China's only heavy ion accelerator, and construction is expected to be finished in 1987. This accelerator is formed primarily of two cyclotrons and the main instrument is a cyclotron composed of four fan-shaped magnets, each of the fan magnets weighing 500 tons. The accelerator can accelerate carbon, helium, argon, krypton, and xenon ions to 4.8 to 100 million electron volts.

Institute of Water Conservancy and Hydroelectric Sciences

The Institute of Water Conservancy and Hydroelectric Sciences was formed through the combination of the CAS Hydraulic Research Office, the Institute of Water Conservancy Sciences of the Ministry of Water Conservancy and the Institute of Electrical Sciences of the Ministry of Electric Power Industry in 1958. It was dispersed in 1969 and rebuilt in February 1978. It continues under the dual leadership of the CAS and the Ministry of Water Conservancy and Electric Power.

It now has 1,381 employees including 742 S&T personnel (103 advanced engineers and 378 engineers).

It has 11 research institutes (and offices): the Institute of Water Conservancy, the Institute of Water Resources, the Silt Institute, the Institute of Hydraulics, the Institute of Structural Materials, the Institute of Rock and Soil Engineering, the Institute of Earthquake Resistance and Protection, the Institute of Hydraulic Generators, the Institute of Automation, the Cooled Water Institute, and the Institute of the History of Water Conservancy. It also has an instruments factory and a computing center.

The institute gradually is developing into China's research center for water conservancy and hydropower science and technology. Its engineering and research tasks are: the necessary engineering measures to build high and stable output in agriculture, development, and utilization of water resources, controlling the silt problem that has appeared on the Huang He and other rivers, high-speed water flow questions in high dam flood discharge channels and sluice holes, high dam structures and new types of construction materials in hydraulic structures, rock and soil engineering problems at the base of large key water conservancy and hydropower projects, theory and practice concerning earthquake resistance and burst resistance engineering, automation of large water turbine generators, water pumps and hydropower plants, economic questions of water conservancy and hydropower projects and questions of cooled water projects in thermal power plants.

Since its reconstruction, the academy has put out nearly 700 research reports and the targets of its services are all the large water conservancy and hydropower projects in China. It already has utilized and extended more than 100 important achievements. It has received 23 national, ministerial, and commission awards and 91 CAS awards. Its research on temperature stress in hydraulic concrete won a natural science award. It has provided the Gezhouba Power Plant with the new ZZ500 rotor and filled in a blank in water turbine generators in China. Its research in the areas of leakage prevention, leak stoppage and reinforcement in hydraulic structures and new waterproof materials as well as in the spreading of powdered coal lime and exterior additives has played an important role in improving project quality and lowering the amount of cement used. New types of energy dissipating engineering like research on narrow crack ridges and broad-tailed piers and measures to reduce or avoid air corrosion for air passage have increased the safety of high dams, and they have been technically creative. It provided the first comprehensive

evaluation of the National Water Resources Survey. Optimized regulation of reservoirs has provided a scientific basis for economical operation of power stations.

President: Lin Bingnan [2651 4426 0589]

Party secretary: Yu Zhong [0060 1813]

Honorary Academic Committee chairmen: Zhang Guangdou [1728 0342 2435] and Huang Wenxi [7806 2429 3556]

Academic Committee chairman: Lin Bingnan

Address: 10 West Chegongzhuanglu, Beijing

Telex: 1172

Telephone: 890781

Institute of Chinese Atomic Energy Sciences

The Institute of Chinese Atomic Energy Sciences is a comprehensive atomic energy science and technology research academy. Its predecessor was the CAS Institute of Modern Physics, established in 1950. In 1958 a research heavy water reactor pile and a 1.2 meter cyclotron were built on a new site and the name was changed to the Institute of Atomic Energy. It was changed to its present name in December 1984 and placed under dual leadership of the Ministry of Nuclear Industry and the CAS. It now has more than 4,000 employees including over 2,000 S&T personnel. It has more than 90 advanced S&T personnel, more than 1,200 middle-level personnel, and 75 graduate students with Master's degrees studying the nuclear sciences.

The institute has 6 research departments in nuclear physics, radiation chemistry, reactor pile engineering, isotopes, electrophysics and nuclear electronics, and 40 research offices in environmental protection, radiation protection, and other areas. It is involved mainly in development of theoretical and experimental research in low-energy nuclear physics, measurement and compiled evaluations of nuclear data, research on condensed state physics, research on handling nuclear fuels after irradiation and handling radioactive wastes, research related to nuclear fuel cycling, safety and analysis of nuclear power and the physics, materials and techniques related to dynamic piles in nuclear power stations, preparation and study of medical radioactive isotopes and other isotopes, various types of radiation sources, labeled compounds, radioimmunological compounds and a small amount of stable isotopes, research on applications of nuclear technologies, environmental evaluation and protection and irradiation measurement and protection methods, exploration of charged particle beam inertial compression nuclear fusion and research on nuclear electronics, computer mathematics, accelerator physics, and engineering, radiational measurement, and other work.

The research achievements of the institute since its founding are: two national natural science awards for atomic nucleus emulsions and halogen counting in 1956. It received 76 superior achievements awards and 347 National Defense Science, Technology, and Industry Commission S&T achievement awards at the National Science Conference in 1978. It won one first place national natural science award, three natural science awards in other places and two national invention awards at the 1982 National Science and Technology Award Conference.

Besides the six accelerators, three reactor piles, and other large-scale facilities it originally had, the Institute of Atomic Energy now has rebuilt a research heavy water reactor pile and cyclotron and completed a pocket-size neutron source pile, a 17 Mev electronic linear accelerator model and a high-current electron pulse accelerator. To be constructed are the HI-13 tandem accelerator, 500,000 Curie-equivalent strong cobalt source irradiation equipment, and other large-scale equipment.

Honorary director: Wang Ganchang [3769 3227 2490]

Director: Dai Chuanceng [2071 0278 2582]

Party secretary: Zhan Yijun [2069 3015 6511]

S&T Committee chairman: Wang Dexi [3076 1795 3556]

Address: Beifang, Fangshan County, Beijing

Telephone: 868221

Institute of Energy Resources

The Institute of Energy Resources was established in September 1980 on the basis of the former CAS Energy Resources Research Office (founded in 1962 and now part of the CAS Natural Energy Resources Comprehensive Examination Commission). It is under the joint leadership of the State Economic Commission and the CAS. It has professional offices in the areas of energy resource equilibrium and forecasting, rational energy resource utilization, rural energy resources and new energy resources, energy resource information projects, information, editing, and publishing. It now has 104 employees including 72 middle-level research personnel (6 advanced researchers).

The institute is China's comprehensive scientific research organ in the area of energy resources and is engaged mainly in research on development, utilization, management, and other questions of China's energy resources and in the provision of scientific data and basic information for the state in formulation of energy resource policies, plans, and management programs. This includes: 1) energy resource reserves, production capacity, transmission routes, and structural areas; 2) technical economic policies in energy resources development and utilization; 3) research on policies, plans, and measures for solving China's rural energy resource problems, as well as technical economic evaluation for utilization of various new types of energy resources; 4) collecting and studying energy resource and economic information from China and foreign countries; and 5) editing and publishing energy resource publications and news report information.

Since its founding, the institute has carried out creative research and made important progress related to energy resource economics and policies. Some representative scientific research work and achievements include: trial compilation of the first national energy resource balance chart, provision of the comprehensive report "Research on Problems of Energy Resource Supplies and Energy Resource Structures in the Beijing-Tianjin-Tangshan Region," evaluation of the economic benefits of energy conservation projects and theoretical methods for their planning and analysis, comprehensive zoning methods for rural energy resources, editing and publishing the periodicals NENGYUAN [ENERGY RESOURCES] and GUOWAI NENGYUAN [FOREIGN ENERGY RESOURCES] and books such as NENGYUAN LIYONG [ENERGY RESOURCE UTILIZATION], NENGYUAN YU GUANLI [ENERGY RESOURCES AND MANAGEMENT], JIENENG ZHISHI GUATU [CHART OF ENERGY CONSERVATION KNOWLEDGE], and others.

Director: Zhang Zhijian [1728 1807 1017]

Academic Committee chairman: Tang Guangze [0781 0342 3419]

Address: No 917, Datunlu, Deshengmenwai, Beijing

Telephone: 446551-651

Shanghai Branch, Chinese Academy of Sciences

The Shanghai Branch is an agency of the Chinese Academy of Sciences in Shanghai. In June 1946 the Shanghai Military Control Commission accepted units of the Central Research Academy assigned to Shanghai and established the Academy Affairs Committee of the (Shanghai region) State-Run Central Committee Research Academy. Its name was changed in 1953 to the Shanghai Office of the CAS (including the Nanjing Office). The Shanghai Branch of the CAS was established in October 1958 and closed in 1970. It was restored in November 1977.

Under leadership by the CAS and the Shanghai Municipal Government, the branch academy manages the 15 CAS research institutes (and stations) in Shanghai as well as the academy's Shanghai S&T Library and the Shanghai Bioengineering Experimental Base Area. The branch academy has 13 offices including a [central] office, a research assistance office, a cadre office, etc. It now has 236 people.

President: Cao Tianqin [2580 1131 2953]

Party secretary: Qing Zhichun [1987 1807 4783]

Advisor: Cheng Guofan [4453 0948 3879]

Address: 319 Yueyanglu, Shanghai

Telex: 5412

Telephone: 310242

Shanghai Institute of Metallurgy

The predecessor of the Shanghai Institute of Metallurgy was the former Central Research Academy Engineering Institute established in 1928. After the founding of the CAS in 1949, it was renamed the CAS Labor Study Experiment Hall. It was placed under the National Defense Science Commission in 1968 and returned to the CAS in 1970 and named the CAS Shanghai Institute of Metallurgy. It now has 702 S&T personnel including 40 advanced S&T personnel and 427 middle-level personnel. It has 14 research offices for silicon integrated circuits, magnetic materials and components, superconductive and special material ion beam technologies and their application, chemical compound conductor materials, etc. as well as an electromechanical plant.

The research tasks of the institute are: 1) microelectronics, mainly in the development of large and super large integrated circuits, photointegrated circuits and optical communications components; 2) functional materials and components, mainly involving research on semiconductors, magnetism, oxygen storage, superconduction and sensitive materials and components; 3) metal corrosion and corrosion-resistant materials, mainly research on new types of protection from corrosion for metals and new types of corrosion resistant materials for use in marine, petroleum industry, and other areas.

The institute has made 274 S&T achievements since its establishment. Topics that have received state awards since 1980 include: basic research on blast furnace smelting of baotitic iron ore, basic research on blast furnace smelting of panzhihua [2372 2655 5363] ferromagnetic iron ore, research on structural and lattice defect X-rays, research on techniques for removing contaminants from quartz household utensils, beam lead PIN diodes, welding techniques for Compton diodes, and high resolution photoetching film. In addition, they also received 17 CAS major achievement awards.

From 1980 to 1983, they published 347 articles in Chinese academic publications and 25 articles in foreign academic publications.

Honorary director: Zou Yuanxi [6760 0337 8764]

Director: Zou Shichang [6760 0013 2490]

Party secretary: Jin Dakang [6855 1129 1660]

Academic Committee chairman: Wu Ziliang [0702 5261 5328]

Address: 865 Changninglu, Shanghai

Telex: 0253

Telephone: 520050

Shanghai Institute of Technical Physics

The Shanghai Institute of Technical Physics was established in 1958 and did research on solid physics and solid electronics. Since 1964, its research has been oriented toward infrared physics and infrared technologies. Over the past 20-plus years, it gradually has developed research on the basis of infrared physics, infrared component materials, and overall infrared systems. In 1983, the Academic Department decided that the direction and tasks of future scientific research were to develop infrared S&T. This mainly includes:

1) exploratory research on infrared physics and far-infrared reception technologies; 2) basic research on infrared components, thin optical membranes and other infrared technologies; 3) research on aviation and space remote sensing exploration technologies; 4) research on infrared heat imaging technologies and intelligent infrared sensing systems; 5) research on development, extension, and application of infrared technologies; etc.

The institute now has more than 900 employees including 250 scientific research personnel at the middle-level and above, and it has 12 research offices, 1 information office, and 1 subsidiary plant.

The institute has made 165 important scientific research achievements since its founding that include 33 projects that received state important S&T achievement awards. They have developed: tellurium cadmium mercury, antimony hydride indium, germanium blended with mercury, lead sulfide, heat sensitive resistors, triglyptal sulfate (TGS), lithium tantalic acid, and other types of infrared component materials, as well as 150 bit and 1,024 bit silicon CCD devices; gas heat recovery type and joint flow type micro coolers for use in aerial and surface infrared systems and radiation coolers for use in space; 1 to 50 μ waveband bandpass, narrow band and ultra-narrow band and round gradually changing wavelength light filters of various types; 0.5 to 22 μ waveband thermocompression multicrystalline ZnS, MgF_2 , CaF_2 , MgO , and gas-phase precipitation multicrystalline antimony selenide and other transparent materials; infrared horizon devices for use in satellite attitude measurements and multichannel scanning radiometers for use in atmospheric satellite cloud mapping, infrared cameras for aerial reconnaissance and aerial multispectral scanners; infrared searching and tracking systems for use in target field measurements; civilian thermal imaging systems, infrared thermometers, hygrometers, and warning devices. In addition, new achievements have been made in research on far-infrared reception and infrared narrow stop-band semiconductor energy band structures and phonon structures, scattering mechanisms of impurity states and carriers and their mutual roles, the transmission and optical qualities of infrared materials at low temperatures and in strong magnetic fields, and other areas.

Director: Tang Dingyuan [3282 1353 0337]

Party secretary: [blank]

Academic Committee chairman: Tang Dingyuan

Address: 420 No 1 Northern Zhongshanlu, Shanghai

Telex: 8241

Telephone: 664880

Shanghai Institute of Optics and Fine Mechanics

The Shanghai Institute of Optics and Fine Mechanics was established in 1964. It was established on the basis of part of the forces at the Changchun Institute of Optical Mechanics and the Beijing Institute of Electronics. Its former name was the Shanghai Branch of the Optics and Fine Mechanics Institute. In 1970 it came under the dual leadership of Shanghai Municipality and the CAS and was changed to its present name. The institute now has 1,395 employees and more than 630 S&T personnel.

It has 14 research offices for high energy gas lasers, laser plasma physics, high output solid lasers, new types of gas lasers, laser spectra, solid and tunable lasers, glass materials, crystalline materials, light sources, technical optics, machine design, electronics technologies, laser physics, and semiconductor lasers. It also has a public laboratory for optics and laser testing, an editorial office, a comprehensive auxiliary plant and an Optics Society that is responsible for publishing GUANGXUE XUEBAO [JOURNAL OF OPTICS], ZHONGGUO GUANGXUE [OPTICS IN CHINA], and so on.

The main sphere of research in the institute is laser science and technology, and it studies strong laser technologies and laser physics, and develops new types of lasers.

More than 200 S&T achievements have been made in the past 20-plus years. The greatest progress has been made in the following areas: 1) research on high energy lasers (neodymium glass and carbon dioxide). They have obtained the main technical measures and parameters for high energy laser systems and ascertained the primary technical requirements for developing high energy lasers. Rather good results have been obtained in exploring the use of high output laser systems in laser nuclear fusion. They have built 10,000 MW circuit and 100,000 MW six circuit neodymium glass laser plasma physics experimental facilities and offered them for use in research on laser plasma physics and other areas to those in and outside of the institute; 2) they have opened up the spheres of research on medium- and small-scale lasers in China and were successful in developing YAG lasers, CO₂ lasers, dye tunable lasers, quasi-molecular lasers, gas far-infrared lasers, semiconductor lasers, etc., and they extended and utilized them within China; 3) development of a group of laser application prototypes like laser range finders, laser drills, laser cutters, MYR laser monochromometers, etc.; 4) development of various types of neodymium blended laser glass (silicates, phosphates, fluorophosphates, etc.), various types of neodymium blended laser crystals (YAG, YAP, neodymium lithium tetraphosphate, etc.) as well as laser light sources, laser membranes, and various types of laser test devices.

Director: Wang Zhijiang [3769 0037 3068]

Party secretary: Zhu Wenyan [2612 2429 1484]

Academic Committee chairman: Wang Zhijiang

Address: West Gate, Jiading Town, Jiading County, Shanghai

Telex: 8024

Telephone: 950486

Shanghai Silicate Institute

The predecessor of the Shanghai Silicate Institute was the CAS Engineering Laboratory Kiln Group. The institute was established formally in March 1960 and named the CAS Institute of Silicate Chemistry and Engineering. Later, it was placed under the National Defense Science Commission and then was returned to the CAS in 1970. It now has 952 employees including 607 S&T personnel (397 middle-level S&T personnel). It has 14 research, technical, and testing offices, and 1 comprehensive plant, and it has built the CAS Intermediate New Chemicals (Inorganic Part) Experimental Base Area in Jiading.

The institute is involved mainly in research on metallurgical fire-resistant materials, high piezoelectric ceramics, industrial glass, high-strength concrete and other traditional silicate materials, as well as on ancient Chinese ceramics. After the institute was established, it moved toward research on new materials needed by new technologies like artificial crystals (rubies, crystal, fluorophlogopite, artificial diamonds, etc.), microcrystalline glass, piezoelectric ceramics, high-frequency and ultrahigh-frequency insulating ceramics and their metallization, aluminum oxide, beryllium oxide and other pure oxide ceramics, high-temperature coatings, temperature control coatings, etc. Since the 1970's it has developed research in new spheres on its original foundation. Examples include lithium niobate, barium sodium niobate, lead molybdenate, tellurium oxide and other electrooptical and acoustoelectric crystals, noncrystalline silicon and sulfur system semiconductor membranes, quartz-based light guide fibers, lead lanthanum ferrozirconate electrooptical ceramics, lead-based iron ferrozirconate electrical phase changing materials, silicon nitride and silicon carbide engineering ceramics, fiber-reinforced compound materials, fast ion ceramics, etc.

Since its establishment, the institute has made 271 S&T achievements including 243 applied achievements, and 198 of them have been or now are being extended. Ten achievements have received first, second, third, and fourth place State Science Commission innovation and invention awards, 2 have received state natural science awards, and 82 have won various awards from the CAS, Shanghai Municipality and various departments and commissions in the State Council. Especially noteworthy are some achievements made through development of cooperation with other units over the past few years. Examples include light guide fibers, insulating technologies for pipes in the Yanshan steam heat grid, bismuth germanide crystals (BGO), high-voltage sodium lights, far-infrared heating coatings, fiber-reinforced ceramic compound materials, silicon nitride engineering ceramics, plasma spray ceramic coatings, inorganic temperature control coatings for man-made satellites, piezoelectric and electrooptical ceramics, photochromic glass, acid and alkaline resistant low-temperature enamel, etc., that have made a contribution to the national economy, national defense, and the development of materials science.

Honorary director: Yan Dongsheng [0917 2639 3932]

Director: Guo Jingkun [6753 2529 0981]

Party secretary: Chen Renpeng [7115 0086 7720]

Academic Committee chairman: Yin Shiwen [3009 0037 2429]

Address: 865 Changninglu, Shanghai

Telex: 5063

Telephone: 522470

Shanghai Institute of Organic Chemistry

The Shanghai Institute of Organic Chemistry was established in 1950. It now has 1,318 employees including 635 S&T personnel (47 advanced S&T personnel and 397 middle-level personnel), as well as 92 graduate students.

The primary research targets of the institute are natural organic products and organic compounds of metallic and nonmetallic elements. It does research on the chemistry of organic compounds and physical organic chemistry and develops reaction methods and theories in organic chemistry. It is engaged mainly in research on the chemistry of natural products (including steroids, prostoglandin, insect pheromones, terpenoids, etc.), biological organic chemistry (including sugars, nucleic acids, polypeptides, protein, etc.), elemental organic chemistry (including fluorine, phosphorous, boron, silicon, and metallic organic chemistry), organic compound chemistry, physical organic chemistry, organic photoelectronic chemistry, organic analytical chemistry, instruments and equipment, information, and other areas.

The research achievements of the institute since its founding include those in the area of natural organic chemistry and biological organic chemistry: the production and structural chemistry of metallic toxins and chain toxins, new synthesis routes for para-adrenaline, synthesis of various types of steroid oral contraceptives, biosynthesis, and applications of unicellular petroleum yeast protein, etc., and they also have cooperated with fraternal units for joint completion of full chemical synthesis of bovine insulin, artificial synthesis of a semimolecule at one end of yeast alanine transfer RNA 3', and the structure and synthesis of artemisia factor. In the area of elemental organic chemistry: development of various types of fluorocarbon polymers, development of various fluorine-bearing surfactants, synthesis and applications of phosphates, the utilization of potassium, palladium, silicon, boron, and other elemental organic reagents in organic synthesis, complex catalytic butadiene reactions and organic rare earth compound. In the area of physical organic chemistry: research on directional selection problems in fluorine-containing alkene free radical addition reactions, micelle chemistry, and one-electron transfer reactions, and their reaction mechanisms.

Honorary director: Wang You [3076 3731]

Director: Huang Weiyuan [7806 4850 0997] (concurrent)

Party secretary: Wang Zhiqin [3769 1807 0530]

Academic Committee chairman: Wang You

Address: 345 Linglinglu, Shanghai

Telex: 0522

Telephone: 313300

Shanghai Institute of Nuclear Research

Preparations for construction of the Shanghai Institute of Nuclear Research began in 1959 and it was established in 1964. It was under the jurisdiction of the Ministry of Nuclear Industry and Shanghai Municipality for a time and was placed under the CAS in January 1978. It now has 1,144 employees including 686 S&T personnel (23 advanced S&T personnel and 447 middle-level S&T personnel).

The institute focuses mainly on S&T and its utilization and development, and it also is active in developing experimental and theoretical research on nuclear physics. It now has 13 research (and design) offices for theoretical nuclear physics, experimental nuclear physics, applied nuclear physics, nuclear electronics and nuclear detection instruments, radiation medicine, isotope labeled compounds, radiation chemistry, radiation safeguards, static electricity accelerators, cyclotrons, reaction piles, multichannel computing and design. It now is in the process of building a radiation technology extension and application base area, and it is expected to be made available for use in 1986.

Since its establishment, the institute has made nearly 200 research achievements at rather high levels. Examples include experimental and theoretical research on the structure of certain nuclides, the nuclear reactions caused by charged particles and neutrons, and the mechanisms and parameters of nuclear fission; the establishment of charged particle activation analysis, neutron activation analysis, proton and isotope source excitation X-ray analysis, nuclear reaction analysis, backscatter and channel analysis and Mossbauer effects, perturbed angular correlation, positron annihilation, and other nuclear analysis technologies and equipment. The institute also has carried out wideranging applied research in such fields as materials science, biology, and medicine. It has developed more than 50 types of nuclear instruments and nuclear detection instruments and more than 10 types of isotope instruments, more than 10 types of radiation medicines, and more than 160 types of tritium and carbon-14 labeled compounds. They have developed research on the radiation chemistry of nuclear fuel post-processing techniques and have made important advances in research on radiation injury to DNA and its components, radiation safeguards, and sensitization mechanisms. They have used radiation chemistry techniques for successful development of excellent multifunction polymer materials. The institute has been successful in developing multistation low energy accelerators and successfully transformed a 1.2-meter fixed energy cyclotron into a K=32 isochronic variable energy cyclotron, and it has made important achievements in research on mechanical processing techniques for an important part of nuclear power station reactor pile fuel components--the positioning framework, etc.

Honorary director: Zhang Jiahua [1728 1367 7520]

Director: Cheng Xiaowu [4453 2556 0124]

Party secretary: Ma Qun [7456 5028]

Academic Committee chairman: Zhang Jiahua

Address: Xinmugiao, Jiading County, Shanghai

Telex: 8009

Telephone: 950998

Shanghai Observatory

The Shanghai Observatory was built in 1962 through the combination of the Xu-Jia-Hui [Zi-Ka-Wei] Observatory and the Xu Shan Observatory, which had been established in 1872 and 1900, respectively.

The Shanghai Observatory currently is engaged mainly in astrometry and the application of new techniques in astronomy, and it has developed the corresponding research on related questions in astrophysics. It has established basic astrometry, photographic astrometry, stellar astronomy, time and frequency [services], radio astronomy, satellite dynamics, astronomical instruments, and other research, as well as a preparation group for an infrared astronomy research office, a computing office, and a library and information office. It now has more than 250 S&T personnel (10 advanced S&T personnel and 114 middle-level S&T personnel).

After liberation, the Shanghai Observatory has had major achievements in taking responsibility for state standard time and frequency shortwave broadcasting tasks and in the area of providing precision UT₁ and UTC time signals. At the end of the 1950's, the Shanghai Observatory linked up with other related observatory stations in China to organize a world time UT₁ service network, and it assumed responsibility for comprehensive data processing and for publishing time correction data and time service reports, annual reports, and other such work. Time precision has been improved continually, and in 1963 it began to move into advanced international ranks. In the early 1970's, they first of all were successful in developing a hydrogen atomic clock and in successive preparation of cesium atomic clocks and rubidium atomic clocks, and they improved comparison equipment, established single-station atomic time measurements and used satellites, lasers, clock transportation, and other measures to carry out high precision time comparison experiments.

In addition, it also focused on astronomical and earth dynamics, developed basic theoretical research and applications of new technologies related to the rotation of the earth, polar migration and plate tectonics, solid tides, astronomy and seismology, star tables and astronomical constants, space and surface reference grids, and other areas. They have established experimental very long baseline interference (VLBI) measurements, satellite laser distance measurements, and satellite Doppler measurement systems. Furthermore, they have carried out precision determinations of the orbits of man-made satellites, orbital forecasts, and processing of observational data. In the area of photographic astrometry, long-term observations and research have been carried out for the proper motion of open clusters and variable stars, location of binary stars, orbital determinations, the evolutionary dynamics of stellar associations and star clusters, location of small planets, and other areas. At the beginning of the 1980's they utilized high atmospheric balloons to develop research work on middle and far-infrared astronomical observations.

Honorary director: Li Heng [2621 3801]

Director: Ye Shuhua [f] [0673 0647 5478]

Party secretary: [blank]

Academic Committee chairman: Ye Shuhua

Address: 80 Nandanlu, Xujiahui, Shanghai

Telex: 2608

Telephone: 380696

Shanghai Institute of Biochemistry

The Shanghai Institute of Biochemistry was established in 1958. Its predecessor was the Biochemistry Section of the CAS Shanghai Institute of Physiology and Biochemistry. It now has 623 employees including 192 S&T personnel (38 advanced S&T personnel and 192 middle-level personnel) and there are 50 graduate students at the institute.

The current research focus of the institute is on molecular biology, and it has developed basic and applied research in such areas as the structure and function of large organic molecules, molecular genetics and genetic engineering, biomembranes, and other areas. It has eight research offices and two research groups that are engaged in research on chemical and enzyme-induced synthesis of polypeptides, proteins and nucleic acids, structural measurements and the relationship between structure and function in large organic molecules (polypeptides, proteins, enzymes, nucleic acids, polysaccharides, etc.), principles of enzyme catalysis and biomembranes, research on molecular genetics (including plant molecular genetics) and genetic engineering, molecular differentiation, metabolic regulation and control, principles of steroid hormone action and tumor biochemistry, development and application of biochemistry instruments and biochemical reagents, research on theoretical biology, etc. In addition, they have a journal editing office that is responsible for editing SHENGWU HUAXUE YU SHENGWU WULI XUEBAO [JOURNAL OF BIOCHEMISTRY AND BIOPHYSICS] and work in the China Biochemistry Society office. They also have two subsidiary plants, the Dongfeng [East Wind] Biochemical Reagent Factory and Factory 320.

The institute has made several hundred scientific research achievements, the most prominent ones being: artificial synthesis of crystalline bovine insulin and yeast alanine transfer RNA (completed in cooperation with related units), resynthesis of insulin from insulin A.B chains, succinic acid dehydrogenase, research on muscles and the structure and function of muscle proteins, research on the structures, functions, and principles of action of insulin, measurement of the primary level structure (amino acid sequence) of green bean trypsin inhibitors and certain polypeptides and proteins, alanine from the silk glands at the tail of castor oil silkworms and glycine transfer RNA, determination of the primary level structure (nucleotide sequence) of 5S RNA, development and application of polypeptide hormones, etc. The institute also has gained pleasing results in research on genetic engineering in recent years. It has, for example, completed cloning and expression of hepatitis B Adr subtype toxin genetic groups in bacteria, yeast, mammalian and other cell systems, and it has determined the sequence of 3,215 pairs of bases for this genetic group. In addition, it also has achieved expression of artificially synthesized leucine enkephalin genes in *Escherichia coli*.

Honorary director: Wang Yinglai [3769 2019 4202]

Director: Lin Qishei [2651 0366 6142]

Party secretary: [blank]

Academic Committee chairman: Wang Yinglai

Address: 320 Yueyanglu, Shanghai

Telex: 3933

Telephone: 374430

Shanghai Institute of Cell Biology

The original name of the Institute of Cell Biology was the Institute of Experimental Biology, established in 1950. In 1952, the institute's plant physiology and entomology research components were divided to establish the Institute of Plant Physiology and the Shanghai Entomology Station. The primary sphere of research concerns the study of animal growth, development and differentiation at the cellular level and issues concerning agriculture and medicine. Its name was changed to the Institute of Cell Biology in 1978.

Since its establishment, the institute has carried out systematic research on maturation and fertilization of amphibian and fish ova, embryo inducement and differentiation, experimental oncology, isolated culture and differentiation of cancer cells, and other areas. Since 1970, it has developed research in areas like nucleic acid synthesis, genetic engineering, developmental biology, mechanisms of canceration, tumor immunology and cell immunology, chromosome formation and structure, cell surface membranes, ultrasound hologram techniques, and other areas.

The major research achievements are: artificial breeding of domestic fish, domestication and extension of castor oil silkworms, applications of a-fetoprotein in early colon cancer diagnosis and surveys, artificial synthesis of DNA and RNA, principles of smallpox powder protein action in inducing labor, establishment of isolated culture of human colon cancer cells, etc.

The orientation of future tasks in the field of cellular biology is toward intensive research on growth, division, differentiation, immunology, and other vital phenomena, as well as genetic expression and its regulation and control in these life activities and to provide services on solving major scientific questions in the areas of bioengineering, agriculture, medicine, and other areas of the national economy.

Honorary director: Zhuang Xiaohui [8369 1321 1920]

Director: Wang Yahui [3769 0068 6540]

Party secretary: [blank]

Academic Committee chairman: Zhaung Xiaohui

Address: 320 Yueyanglu, Shanghai

Telex: 3334

Telephone: 370080 (central switchboard)

Shanghai Institute of Physiology

The Shanghai Institute of Physiology was established in 1958. Its predecessor was the Physiology Section of the CAS Institute of Physiology and Biochemistry that was established in 1950. It was transferred downward to Shanghai Municipality in 1967 and returned to the CAS in 1978. It now has 331 employees including 4 research personnel, 16 associate research personnel and corresponding advanced engineers, and 121 middle-level research and technical personnel.

The primary spheres of research are: general physiology and biophysics of neuromuscular systems, the physiology of the central nervous system, the physiology of special sensory organs (mainly sight and hearing), the physiology of respiration and cycling, the physiology of reproduction, bioelectronics, computer applications in physiology, and other areas. It now is focusing in a rather concentrated fashion on development of research related to neurophysiology.

The institute's major achievements since its establishment are: additional proof of connective tissue sheaths as an effective dispersion blocker, using unsheathed nerves to study the electric potential of vertebrate nerves, discovery of ultrahigh-speed excitation conduction nerve fibers and research on their structural and functional characteristics, research on the nutritional relationships between nerves and muscles, the discovery of the phenomenon of fattening after denervation of chicken slow muscle fibers, analysis of the factors that determine muscle fiber types, research on the basis of fine structure of muscle contraction, research on the formational mechanisms of conditioned reflexes, the role of the various recursive system nerve sources in the structure of the cerebral cortex and subcortex in conditioned reflex formation, research on clinical applications of retinal electrographs and standard color perception of the Chinese people, research on the effects of intense noise on human hearing systems and its prevention, research on tolerance and habituation of the respiratory and cardiovascular systems to low oxygen in plateau regions, research on neurotoxins (snake venom, scorpion venom, Toosendanin, etc.), research on the principles of action of new types of male and female contraceptives, and design, development and extension of various types of instruments and equipment in the area of bioelectronics and computers.

Honorary director: Feng Depei [7458 1795 1014]

Director: Mei Zhentong [2734 6966 1749]

Party secretary: [blank]

Academic Committee chairman: Liu Yumin [0491 5148 3046]

Address: 320 Yueyanglu, Shanghai

Telex: 3932

Telephone: 370080

Shanghai Institute of Brain Research

The predecessor of the Shanghai Institute of Brain Research was a section of the Brain Research Office of the CAS Shanghai Institute of Physiology. The institute was established formally in 1980. It now has 61 employees, 44 S&T personnel (including 8 advanced researchers and 16 middle-level research personnel). It has 10 research offices in such areas as experimental neurology, neurocytology, neuroanatomy, bioelectronics, neural behavior, neurophysiology, and others, and it has a public technology office, a small animal building, a metal working shop, and a visitor's laboratory.

This is China's only brain research institute. It is involved mainly in basic theoretical research on normal brain structure and function as well as research on the prevention of diseases of the central nervous system. The primary spheres of research at present are: production and control mechanisms of pain, linkage relationships between the neurons in the brain, production mechanisms of neuron epileptic discharge, autonomic functions of the brain, the neural foundation of fine movement, neural circuits in the optic center, the shape and function of nerve cells cultivated *ex vitro*, the neurological basis of behavior (including research on learning, memory and pain behavior), brain development, etc.

The institute also has made a rather prominent contribution to research on the mechanisms of acupuncture analgesia. It has received a National Science Society award and a first-place CAS scientific research achievement award, and Professor Zhang Xiangtong [1728 7449 2717] received the international "Threshold Award." The institute has published a total of 48 articles, 19 of them in international magazines. It also has presented 52 scholarly reports or articles at international and national conferences.

In the future, the institute also will develop research work in developmental neurology, molecular neurophysiology, neurobiochemistry, neuropharmacology, brain restoration after oxygen deprivation, and other areas, and it will establish the corresponding laboratories, primate laboratories, brain specimen offices, etc.

Honorary director: Zhang Xiangtong [1728 7449 2717]

Director: Shen E [3088 6948]

Party secretary: [blank]

Academic Committee chairman: Zhang Xiangtong

Address: 319 Yueyanglu, Shanghai

Telex: 2813

Telephone: 310242

Shanghai Institute of Pharmacology

The predecessor of the Shanghai Institute of Pharmacology was the Pharmacology Research Institute of the State-Run Beijing Research Academy established in 1932. It was placed under the CAS in 1949 and named the CAS Institute of Pharmacology. It was placed under leadership of Shanghai Municipality in 1970 and named the Shanghai Institute of Pharmacology. It was returned to the CAS in 1978 and named the CAS Shanghai Institute of Pharmacology. It now has 551 employees including 332 research and technical personnel (35 with advanced technical titles).

The institute is engaged mainly in research on the structure, function, and mechanisms of action of bioactive materials, primarily natural products, and it carries out systematic research on chemical separation, purification, structural determination, comprehensive synthesis, and other topics. It studies bioactive materials and their interaction with organisms. It describes their principles of action at the cellular and molecular levels and is developing natural product chemistry and cytomolecular pharmacology. Its primary tasks are to search for cancer-preventing bioactive materials and study the principles of their action and reverse effects, to do research on neuroactive peptides, neurorecursives and their mutual relationship with receptors, research on family planning medications, genetic regulation and control of Actinomyces and medical chelating agents, applications of quantum chemistry in pharmacological research, etc.

The institute has made 60 important scientific research achievements over the years. They include research on the site of morphine analgesic action and mechanisms of analgesia and research on the active components of Chinese herbal medicines. Two state second-place natural science awards were received for the discovery of 12 new types of effective components. A third-place innovation and invention award was received for the muscle relaxant chloromethyl levocurare. In addition, various types of awards have been received for improvements in penicillin sylvite crystallization methods, producing bacterial varieties and techniques for neomycin, mycostatin, antinomycin-D, Changchun neoalkali, and other medicines, and for development and production of several dozen types of new medicines.

Honorary director: Gao Yisheng [7559 1837 3932]

Director: Xie Yuyuan [6200 3022 0337]

Party secretary: [blank]

Academic Committee chairman: Ji Ruyuan [1518 3067 6663]

Address: 319 Yueyanglu, Shanghai

Telex: 3434

Telephone: 311833

Shanghai Institute of Plant Physiology

The Shanghai Institute of Plant Physiology was established in 1953. Its predecessor was the Plant Physiology Office of the CAS Experimental Biology Institute. It now has nearly 500 employees including more than 300 S&T personnel (28 advanced researchers).

The institute studies the major laws and characteristics of biological transformation in plants and microbes under the influence of environmental factors at the molecular, cellular, organism and colony levels in life activities like growth and differentiation, material metabolism, energy conversion, and genetic variation. It now is involved mainly in research on mathematical modeling of photosynthetic energy conversion and chloroplast membrane structure and function, photosynthetic carbon metabolism and its regulation, light energy utilization and yield formation in crops, expression and genetic manipulation of nitrogen-fixing genes, protoplasts and cell mutants, genetic engineering on plant cells, plant hormone receptor proteins, regulation and control of secondary metabolism of microbes in biosynthesis, bacterial seat transfer, microbial oxidation, plant reaction and resistance to adversity, biological nitrogen fixation, ion absorption in plant organization and root systems, the developmental physiology of plant reproductive organs, inter-cellular material transport and information transmission, and other topics.

The institute has published more than 1,000 articles and reports since it was established, and it has made more than 50 important scientific research achievements including 21 items that received awards at the academy and provincial level and above. The more prominent achievements are: measurement of quantum amounts required in photosynthetic phosphorylation, the discovery of a high energy state and intermediate state in photosynthetic phosphorylation and the suggested model hypothesis that "different high energy states exist," confirmation of the identity of chloroplast and chondriosome phosphorylation structures, multistructural representation modeling and regulation of PEP carboxylase, discovery of the role of RNA in bacterial genetic factors, analysis of the fine structure of nitrogen fixing genes and regulation and control functions, the discovery of the bacterial seat transfer Tn233 and plotting its physical charted spectrum, *Streptomyces aureofaciens* physiology and aureomycin production, development of acetone butanol fermentation techniques, separation of cellulase from high vitality bacteria and its application; the physiological reasons for the drop-off of cotton bolls and determination of high and stable output cultivation measures, the formation of growth and development organs in rice and wheat, description of colony utilization of light energy and its relationship to output, the effects of high- and low-temperatures on rice flowering and their prevention, applications of ethephon and chemical herbicides in agriculture, the mechanisms of sulfur dioxide injury to plants, the establishment of plant cell mutants, cell fusion and successful cultivation of several types of test-tube plants, discovery of intercellular linkages and communications and several types of material transfer patterns in plants.

Honorary director: Yin Hongzhang [3009 1347 4545]

Director: Shen Yungang [3088 0336 6921]

Party secretary: [blank]

Academic Committee chairman: Yin Hongzhang

Address: 300 Fenglinlu, Shanghai

Telex: 3234

Telephone: 372090

Shanghai Institute of Entomology

The Shanghai Institute of Entomology was established in 1959. It now has 207 employees including 151 S&T personnel (8 advanced research personnel and 75 middle-level research and technical personnel).

The Shanghai Institute of Entomology is involved mainly in developing research on experimental entomology and focuses its efforts on agriculture in China and insects that endanger public health. It utilizes the modern technologies of experimental entomology to explore new methods, routes, and theories of pest prevention. Prior to 1960, it established rural research base areas in Shanghai, Jiangsu, Zhejiang, and other locations to carry out prevention work for snout moth's larva, wheat aphids, citrus bark borers, citrus alabastrum maggots, vegetable aphids, mosquitos, termites, etc. After 1960, it mainly was engaged in research on paddy colony ecology, chemical mosquito prevention and resistance mechanisms, termite taxonomic differentiation, residual amounts of farm chemicals, etc. The institute now is engaged in applied basic and basic theoretical research on insect hormones, pheromones, environmental toxicity of insecticides, pest resistance to chemicals, insect viruses, comprehensive prevention of cotton field pests, regional taxonomy of insects, etc.

The main research achievements of the institute since its establishment are: research on cotton pink bollworm pheromones, a termiticide, mulberry caterpillar polyhedron virus, the selective action of dimethoate on tussah and braided abdomen parasitic flies, raising yellow rice borers fed on artificial feed, artificial raising of Chinese anopheles mosquitos, etc. In addition, they also have been successful in developing an antenna potentiometer, a critical point dryer, and other instruments.

Honorary director: Yang Pinglan [2799 1627 3482]

Director: Zhu Guokai [2921 0948 0418]

Party secretary: Li Yujin [2621 3768 3866]

Academic Committee chairman: Yang Pinglan

Address: 225 South Chongqinglu, Shanghai

Telex: 1487

Telephone: 282039

Shanghai Library

The Shanghai Library was established in March 1953 and named the Shanghai Branch Library of the CAS Library. It was placed under Shanghai Municipality during the Cultural Revolution. It was returned to the CAS in 1978 and renamed the Shanghai Library of the CAS Library.

The library now has five professional departments for document processing, reader services, technical services, computer services, and information. It has a total of 121 employees including 29 personnel with middle-level professional titles and 35 personnel with elementary professional titles.

The library is a scientific library that focuses on collection and storage of documents in the biological sciences as a service to scientific research work in CAS research institutes in the Shanghai region, especially the Institutes of Physiology, Biochemistry, Plant Physiology, Cell Biology, and the Brain. It gradually has become the Shanghai regional library information center for the CAS and a document center for the biological sciences in the CAS as a whole.

Director: Gong Yueting [7895 1471 0080]

Party secretary: Lu Haijin [7120 3189 6855]

Address: 319 Yueyanglu, Shanghai

Telephone: 379650-16

Shanghai Biological Engineering Test Base

To meet the needs of the four modernizations, the CAS proposed and received agreement from the State Planning Commission in 1978 to establish the Shanghai Biological Engineering Test Base in Shanghai with its rather strong foundation in experimental biology during the Seventh 5-Year Plan.

The base area is a bioengineering research and development center oriented toward all of China. It plays a role as a bridge and intermediate link between scientific research and production and the base area uses applied research to develop research and experimental offices to enlarge experiments or intermediate experiments to provide industrial departments or other user units with new technologies and new techniques, it provides industrial departments with bioengineering products that are technologically intensive, used in small amounts, and have high results, and that are difficult to produce, and it is laying a foundation for the new bioengineering industry in China.

The orientation and tasks of the base area are to focus on genetic engineering on the basis of fermentation engineering for appropriate development of cell engineering and yeast engineering. In addition, its establishment was followed by 20 research projects and intermediate research on 4 products. Its completion is estimated to take 7 years and a preparation office responsible for construction arrangements for the base area has been set up.

Address: Shanghai

Preparatory director: Wang Zhiya [3769 5365 3209]

Nanjing Branch, Chinese Academy of Sciences

In 1950, the CAS formally took over scientific research units in Nanjing that were part of the former Central Research Academy and established the Nanjing Branch of the Chinese Academy of Sciences East China Office. Under its jurisdiction are the Sociology Institute, the Physics Institute, the Geology Institute, the Geophysics Institute, the Purple Mountain Observatory, the Geography Institute, the Pedology Office, and other units. Later, it had several names and closed down in 1969.

The Nanjing Branch of the Chinese Academy of Sciences was established in November 1978 and it has jurisdiction over five units, the Nanjing Institute of Geology and Paleontology, the Nanjing Institute of Pedology, the Nanjing Institute of Geography, the Purple Mountain Observatory, and the Nanjing Astronomical Instruments Factory.

The scientific research units under the Nanjing Branch hold important positions in research in the earth and astronomical sciences research in China. It has rather strong research forces and many of its achievements have received high evaluations in international academic circles.

Director: She Zhixiang [0152 0037 4382]

Party secretary: Zhao Xianzi [6392 0341 1320]

Advisors: Shang Zuyu [1424 4371 6877] and Mu Enzhi [4476 1869 0037]

Address: 39 East Beijinglu, Nanjing

Telex: 0433

Telephone: 34036

Nanjing Institute of Geology and Paleontology

The Nanjing Institute of Geology and Paleontology was established in May 1951 and formerly was called the Institute of Paleontology. It was given its present name in 1968. It is engaged mainly in research on paleobotany, invertebrate paleontology, and biostratigraphy. It has seven research offices: sporopollen, paleobotany, lower-order paleobotany, sedimentary rock, and three invertebrate research offices. The number of fossil class research areas has grown to more than 40. It also has a technical office and an information office (including a library and specimen exhibit hall). It now has 330 employees including 163 research personnel (36 advanced research personnel and 6 academic committee members).

Since its establishment, the institute has focused on basic theoretical research in paleontology and biostratigraphy, and it also participates in research on petroleum, coal, iron, phosphorus, and other energy resources and resource stratigraphy. It has completed more than 1,200 research projects and received almost 100 awards. The main ones include 17 volumes on Chinese fossils of various classes, a summary of all strata in China, a comparative table of the strata of each period in China, the boundary lines of all strata in China, plant colonies in Mesozoic extensional strata in northern Shaanxi, late Permian cephalopods in southern China, Ordovician trilobite communities in central and southwestern China, Ordovician graptolites in southwestern China, Yuemengou group plant fossils in north China, Permian Aeshinidae in Guangxi, Guizhou, and Sichuan, stratigraphy and paleontology of the Mount Qomolangma region, Sinian and Triassic strata and biota of the southwest, the stratigraphy of Xizang, Cenozoic biota of the Bohai Gulf coast, the stratigraphy of the Taize He basin in eastern Liaoning, Mesozoic and Cenozoic red beds and biota in Yunnan, the paleontology of Qilian Shan, etc. The research achievements are published mainly in ZHONGGUO GUSHENGWU ZHI [ACTA PALEONTOLOGICA SINICA], ZHONGGUO KEXUEYUAN NANJING DIZHI GUSHENGWU YANJIUSUO JIKAN [COLLECTED PAPERS OF THE CHINESE ACADEMY OF SCIENCES NANJING INSTITUTE OF GEOLOGY AND PALEONTOLOGY], ZHONGGUO KEXUEYUAN NANJING DIZHI GUSHENGWU YANJIUSUO CONGKAN [COLLECTED ARTICLES OF THE CHINESE ACADEMY OF SCIENCES NANJING INSTITUTE OF GEOLOGY AND PALEONTOLOGY], HUAXIA GUSHENGWU [CHINESE PALEONTOLOGY] (English edition), GUSHENGWU XUEBAO [JOURNAL OF PALEONTOLOGY], and others.

Honorary director: Zhao Jinke [6392 6855 4430]

Director: Wu Wangshi [0702 3769 1193]

Party secretary: Yang Jun [2799 6511]

Address: 39 East Beijnglu, Nanjing

Telex: 0657

Telephone: 33298; 33546

Nanjing Institute of Pedology

The Nanjing Institute of Pedology was established in 1953. Its predecessor was the Institute of Pedology of the Geological Survey Institute that was established in 1930.

It now has research offices for soil geography, soil-plant nutrition chemistry, soil physical chemistry, soil physiochemistry, soil salinization geochemistry, soil electrochemistry, soil physics, soil microbiology, soil environmental protection, soil ecology, and other disciplines and it also has office groups for experimental technologies, electronic computers, printed information, editing, translating, and publishing, as well as an auxiliary factory.

Since its establishment, the institute has undertaken rather intensive research on a national soil resource investigation, improvement, and rational fertilization of low-yield soils, regularities in the type and distribution of soil occurrences, physical, chemical, and biological processes of soils, the relationship between soil environmental conditions and plant growth, and other areas. In recent years, it mainly has been involved in research on soil resources and their utilization, soil improvement and fertilization, rational fertilization, soil environment protection, soil occurrence categories, basic soil qualities, soil information systems, and applications of new technologies in the key development regions of China.

The institute has made more than 260 research achievements since its establishment. It was responsible for editing more than 40 special works like ZHONGGUO TURANG [SOILS IN CHINA], HUABEI PINGYUAN TURANG [SOILS OF THE NORTH CHINA PLAIN], ZHONGGUO TAIHU DIQU SHUIDAO TU [PADDY SOILS OF CHINA'S TAI LAKE REGION], ZHONGGUO HONGRANG [RED EARTH OF CHINA], TURANG DIANHUAXUE XINGZHI JI QI YANJIU FA [ELECTROCHEMICAL CHARACTERISTICS OF SOILS AND THEIR RESEARCH METHODS], TURANG JIAOTI [SOIL COLLOIDS], HUAZHONG YAREDAI TURANG [SUBTROPICAL SOILS OF CENTRAL CHINA], SHUIDAO TU DE WULI HUAXUE [PHYSICAL CHEMISTRY OF PADDY SOILS], etc. It also compiled the ZHONGGUO TURANG QUHUA [SOIL ZONES OF CHINA] and ZHONGGUO HONGHUANGRANG DIQU TURANG LIYONG GAILIANG QUHUA [SOIL UTILIZATION AND IMPROVEMENT ZONING IN THE RED EARTH AND LOESS SOIL REGIONS OF CHINA], as well as 1:10,000,000 and 1:4,000,000 scale soil maps of China. It has made contributions in developing soil surveys and fertilizer applications in areas suited to forests for tropical crops focused on bananas, in comprehensive control of drought, waterlogging, and salinization-alkalinization in the Huang-Huai-Hai Plain and its role in comprehensive prevention of drought, waterlogging, and salinization-alkalinization in well irrigation and drainage, in forming pellets of ammonium hydrogencarbonate fertilizer for deep application, on the content, state and effective utilization of phosphorus, potassium, and trace elements in China's main soil types, in the formation, characteristics and fertilization of paddy soils in China, on the pollution of soil by trichloroacetaldehyde, heavy metals, and farm chemicals and its prevention, on development of ion selective electrodes, in diagnosis of soil-plant nutrition, and in other areas.

Honorary director: Xiong Yi [3574 3015] (deceased)

Director: Zhao Qiguo [6392 0366 0948]

Party secretary: Shi Hua [4258 5478]

Academic Committee chairman: Xiong Yi

Address: 71 East Beijnglu, Nanjing

Telex: 1099

Telephone: 33318

Nanjing Institute of Geography

The Nanjing Institute of Geography was established in October 1958 under dual leadership by the CAS and Jiangsu Province, with the CAS being the primary leader. It was transferred downward to Jiangsu Province in July 1970 and recovered by the CAS in June 1979. It now has 232 employees including 151 S&T personnel (13 advanced research and technical personnel and 26 middle-level personnel). It has established seven research offices for lake hydro-meteorology, lake sedimentary relief, lake bioecology, natural geography, economic geography, cartography, and S&T information. The institute is engaged mainly in research on a national lake survey and comprehensive utilization. It also is involved in research and compilation of maps and atlases in agricultural geography, urban geography, environmental sciences, and specialized topics.

Over the past 20-plus years, the institute has completed comprehensive survey research on lakes in the primary plain of the middle and lower reaches of the Chang Jiang and on lakes in the Xizang and Yunnan-Guizhou Plains, as well as a model lake survey in the northeast, Nei Monggol, and Xinjiang regions. It has participated in and assisted agricultural natural resource surveys in Xinjiang, Jiangsu, and some parts of eastern China. It has developed research on urban planning, small town construction, paths to urbanization in economically developed regions, city and town deployment, and urban systems. It has done research on environmental quality in cities and lake basins and worked on technical methods for natural purification of pollutants based on landscape ecology, lake environment prediction, and other areas. It also has completed JIANGSU SHENG DITU JI [ATLAS OF JIANGSU PROVINCE], JIANGSU SHENG NONGYE DITU JI [ATLAS OF AGRICULTURE IN JIANGSU PROVINCE], ZHONGHUA RENMIN GONGREGUO ZHONGLIU DITU JI [ATLAS OF TUMORS IN THE PRC], JIANGSU HUPO ZHI [LAKES OF JIANGSU], ZHONGGUO HUPO GAILUN [OUTLINE OF LAKES IN CHINA], ZHONGGUO ZONGHE NONGYE QIHUA [COMPREHENSIVE AGRICULTURAL ZONING IN CHINA], JIANGSU ZHONGHE NONGYE QIHUA [COMPREHENSIVE AGRICULTURAL ZONING IN JIANGSU], and other multidisciplinary works.

Honorary director: Zhou Lisan [0719 4539 0005]

Director: [blank]

Party secretary: [blank]

Academic Committee chairman: Zhou Lisan

Address: 73 East Bejinglu, Nanjing

Telex: 1472

Telephone: 32936

Purple Mountain Observatory

Preparations for construction of the Purple Mountain Observatory began in 1928, and it was established in 1934 and named the Central Research Academy Institute of Astronomy, Purple Mountain Observatory. It was moved to Kuming in 1938 because of the anti-Japanese war and moved back to Nanjing's Purple Mountain in October 1946. the CAS was established in 1949 and the Institute of Astronomy was renamed the Purple Mountain Observatory and placed under the jurisdiction of the CAS.

It now has 410 employees including 293 S&T personnel. It has research offices (groups) for time, calendrical calculations, planets, stars, stellar physics, solar physics, radio astronomy, space astronomy, theoretical astronomy, theories of artificial satellite motion, and astronomical instruments, as well as a millimeter wave radio astronomy monitoring station.

The observatory is a comprehensive astronomical observatory engaged mainly in research on astrophysics and astrodynamics. It currently is involved in research work related to space astronomy, radio astronomy, artificial satellites, solar physics, stellar physics, planets, theoretical astronomy, calendrical calculations, applied astronomy, astronomical instruments and computers, and other areas.

Astronomical research in China touches upon many spheres and many of these spheres were opened up for the first time by the Purple Mountain Observatory. A substantial number of scientific research achievements at a certain level have been made since its establishment. Examples include the discovery of a number of asteroids, comets, flare stars, and other new celestial bodies. It joined with observatory stations in other countries for the first detection of the existence of rings around Uranus. It has successfully solved independent compilation of an astronomical calendar and it participated in orbital design and calculation work for China's first artificial Earth satellite. It has issued and published openly about 700 articles, reports, works, and translations. Some scientific research achievements have received national natural science awards, CAS S&T achievement awards, National Defense Science Commission achievement awards, and provincial S&T achievement awards.

Honorary director: Zhang Yuzhe [1728 6877 0772]

Director: [blank]

Party secretary: Qiao Dingsheng [0829 7844 5116]

Academic Committee chairman: Gong Shumo [7895 2885 2875]

Address: 2 West Beijinglu, Nanjing

Telex: 4793

Telephone: 33921

Nanjing Astronomical Instruments Factory

Preparations for construction of the Nanjing Astronomical Instruments Factory began in 1958 and in 1960 it was named the CAS Nanjing Astronomical Instruments Factory. It now has 528 employees including 151 S&T personnel (6 advanced personnel and 96 middle-level personnel).

The main task of this factory is to provide optical and radio detection instruments and equipment for astronomical research in China. The representative scientific research achievements made by the factory since it was built include: 43-, 60-, and 80-cm refractor telescopes, 60-cm experimental refractor telescopes, 40-cm flat solar telescopes, multiwaveband spectrographs, HC-1 satellite tracking cameras, Type II optoelectronic astrolabes, Type I vacuum camera zenith cylinders, chromospheric telescopes, various types of transits, solar eclipse spectroscopes, large-scale man-made satellite tracking cameras, solar magnetic field telescopes, and a to-be-completed 2.16-m telescope, 13.7-m radio telescope, 1.2-m infrared telescope, etc.

Director: Zuo Shijie [1563 1102 2638]

Party secretary: Dai Yao [2071 5069]

Acting Technical Committee chairman: Pan Junhua [3382 0689 7520]

Address: Bancang Village, Taipingmenwai, Nanjing

Telex: 1131

Telephone: 46191

Wuhan Branch, Chinese Academy of Sciences

The Wuhan Branch Academy is an agency of the CAS that manages nine research offices (factories and libraries) in the Wuhan area: the Wuhan Institute of Mathematical Physics, the Wuhan Institute of Rock and Soil Mechanics, the Wuhan Institute of Physics, the Institute of Measurement and Geophysics, the Institute of Hydrobiology, the Wuhan Institute of Botany, the Wuhan Institute of Virology, the Wuhan Scientific Instruments Factory, and the Wuhan Library. It also acts as an agent for the Changsha Institute of Geotectonics located in Hunan.

The Wuhan Branch Academy of the Chinese Academy of Sciences has a total of 2,685 employees including 2,034 S&T personnel (88 advanced research and technical personnel and 623 middle-level personnel). The branch organs and units under the jurisdiction of the branch have a total of 202 employees.

Director: Qian Baogong [6929 0202 0501]

Party secretary: Zheng Yaohua [6774 5069 5478]

Advisors: Xu Xi [1776 1585] and Wang Xinyi [3076 1800 0001]

Address: Xiaohong Shan, Wuchang District, Wuhan

Telex: 6159

Telephone: 75511

Wuhan Institute of Rock and Soil Mechanics

The predecessor of the Wuhan Institute of Rock and Soil Mechanics was the South-Central Institute of Mechanics, and it was given its present name in 1962. It now has 329 employees including 192 scientific research and technical personnel. It has 15 topical groups, an information office, a computer office, and a subsidiary factory.

Rock and soil dynamics concerns specialized research on rock mechanics and soil mechanics. The main focus is research on the basic dynamic and static mechanics qualities of rock and soil and reinforcement theory, as well as applications of these theories in engineering and construction. It carries out research on experimental stress analysis and calculation methods in the static and dynamic mechanics of rock and soil, underground lubricating chambers, the stability of rock and soil engineering, energy resources and communications, mine construction, tall structure foundations, and harbor pier construction, as well as instruments and equipment associated with rock and soil mechanics.

Since its establishment, the institute has completed nearly 200 important research topics and made 168 scientific research achievements. The more prominent ones are: research on the stability of the Nanbang slope at the Daye Iron Mine, research on the stability of the slopes of the open pit Panzhihua Ferrovanadium and Magnetite Mine at Dukou in Sichuan, research on the stability of the rock surrounding the large span cave reservoirs, research on the characteristics of surface subsidence and flow deformation at Shanghai, research on large plate foundations of sedimentary basements, the JDW-1 displacement telemeters, electromagnetic soil dynamics triaxial meters, model 82-01 rock ultrasonic horizontal wave transducers, thermal expansion rigid presses, rock torsion flow deformation meters, and so on.

Director: Yuan Jianxin [5913 1696 2450]
Party secretary: Zhang Jihua [1728 0679 2849]

Address: Xiaohong Shan, Wuchang, Wuhan
Telex: 5588
Telephone: 72492

The Model UL-1 Bladder Stone Crusher

This device was developed by the CAS Institute of Acoustics. The electrodes pass through a bladder lens and use hydroelectronic reactions for multiple discharges under direct observation to crush stones that have calcified within the bladder, after which distilled water is used to flush the particles out of the body. The sufferer can avoid surgery and the operation is extremely safe and reliable. It has been warmly welcomed in clinical practice. This instrument now has reached the level of similar products in foreign countries.

Wuhan Institute of Physics

The Wuhan Institute of Physics was established in 1962 on the basis of the combination and reorganization of more than 10 research units including the former Five South-Central Provinces Electronics Institute, the Institute of Atomic Energy, the Semiconductor Institute, and others. Later it was placed under the National Defense Science Commission and returned to the CAS in 1979. It now has 468 employees including 18 advanced researchers and advanced engineers and 130 middle-level S&T personnel.

The institute is involved primarily in research work related to spectroscopy, atomic frequency and time standards, atomic molecular physics, acoustics, ionospheric physics, and other areas. It has six research offices, one technical office, and one information office. The primary tasks of each of the offices are: the First Office is involved in research in spectroscopic theories, new methods and techniques for spectroscopic instruments, and spectroscopic applications in chemistry, the chemical industry, biology, medicine, and other fields. The Second Office studies hydrogen lasers, rubidium rubidium lasers, rubidium gas bubble atomic clocks, laser frequency standards, and measurement of frequency stability, etc. The Third Office has established an ionospheric observation station that carries out continuous monitoring and recording of ionospheric characteristics, ionospheric acoustic heavy wave interference, transitory phenomena of the ionosphere, and D-layer structure and long-wave broadcasting. The Fourth Office carries out research on ultrasound detection, medical ultrasound, acoustic holography, piezoelectric materials, and transducers. The Fifth Office studies laser spectra and uses laser spectra to study the structure of atomic molecules. The Sixth Office mainly studies atomic molecular physics theory.

The more important S&T achievements of the institute since its establishment include: paramagnetic resonators, nuclear quadropole resonators, 360 MHz superconducting nuclear magnetic resonators, rubidium lasers, rubidium gas bubble atomic clocks, hydrogen lasers, various types of superconductor detection instruments, ultrasound blood flow meters, ultrasonic Doppler coronary plotters, 64 x 64 square matrix acoustic holographs, superfast aerodynamic centrifuges, etc.

Director: Wu Qinyi [0702 2953 5030]

Party secretary: Peng Qifu [1756 0796 8099]

Academic Committee chairman: Wei Bao'e [7279 1405 6948]

Address: Xiaohong Shan, Wuchang, Wuhan

Telex: 5454

Telephone: 75161

Wuhan Institute of Virology

The Wuhan Institute of Virology was established in 1956 as the Wuhan Microbiology Research Office. Its name was changed in 1960 to the CAS South Central Microbiology Institute. Later, it was transferred down to Hubei Province. It was returned to the CAS in 1978 and renamed the CAS Wuhan Institute of Virology. It now has 262 employees including 11 advanced research personnel and 95 middle-level research personnel. The institute is engaged mainly in research on virology and also is developing research on environmental microbiology and agricultural microbiology. Its research in the area of virology involves viral classification and preservation, the expression, regulation, and control of viral genetic material in host cells, viral disease sources and their prevention, and viral applications in agricultural pest prevention. In environmental virology, they are involved mainly in research on pesticide monitoring and microbial reduction. Their research in agricultural microbiology is focused on organic nitrogen fixation and bacteria that are sources of insect diseases.

The institute has made 83 achievements since it was founded. Their achievements have received four National Science Conference awards, nine Hubei Province Science Conference awards, one first place CAS award, one second place CAS award, six third and fourth place CAS awards, and one Hubei Province scientific and technical achievement award.

Deputy director: Ding Daming [0002 6671 2494] (acting director)

Party secretary: [blank]

Academic Committee chairman: Jian Jieran [4675 3381 3544]

Address: Xiaohongshan, Wuchang District, Wuhan

Telex: 7114
Telephone: 76641

Pollution Regularities and Environmental Quality in the Beijing-Tianjin-Bohai Gulf Region

Relevant CAS institutes are engaged in research focused on the overall environment in the Beijing-Tianjin-Bohai Gulf Region to reveal the regularities of pollution in this region and to explore rational development programs and ways to improve the environment to provide a scientific basis for environmental zoning and planning. Their research covers eight topics including atmospheric, continental, marine, and other pollution. They are engaged in comprehensive large-scale temporal and spatial research and some of their achievements have been adopted by national bureaus and environmental protection departments in the Beijing-Tianjin region.

Wuhan Institute of Mathematical Physics

The Wuhan Institute of Mathematical Physics was established in 1979. Its predecessor was the CAS Mathematical Computing Technology Institute.

The institute is engaged mainly in research concerning the mathematical laws of physical and biological phenomena and it develops mathematical theories and methods. One of its important points is a stress on integration of mathematics with other sciences and technologies. It has five research offices for the theory of functions, mathematical physics, artificial intelligence, control theory and information, and an optimization laboratory.

The institute has done a great deal of research in mathematics and computing technologies and achieved definite successes. The works already published include BANCHUN HANSHU ZHIXIAN LILUN [SEMI-SCALAR FUNCTION VALUE LINE THEORY], ZISHOU HANSHU YU MINKOWSKI HANSHU [AUTOMORPHIC FUNCTIONS AND MINKOWSKI FUNCTIONS], DIANCIFENG BAO SHUO [THEORY OF ELECTROMAGNETIC WIND EXPLOSIONS], SHULI DIZHENXUE [MATHEMATICAL SEISMOLOGY], DAOTI YU BANDAOTI [CONDUCTORS AND SEMI-CONDUCTORS], YIBAN XIANGDUIXING LIANGZICHANG LUN [GENERAL RELATIVITY QUANTUM FIELD THEORY], GONGYE ZIDONGHUA KONGZHI YU SHUXUE MOXING [INDUSTRIAL AUTOMATION CONTROL AND MATHEMATICAL MODELING], etc.

Director: Li Guoping [2621 0948 1627] (concurrent)

Party secretary: Yan Dingru [0917 1353 1172]

Academic Committee chairman: [blank]

Address: Xiaohongshan, Wuchang District, Wuhan

Telex: 5095

Telephone: 75511-392 (office)

(Wuhan) Institute of Surveying and Geophysics

The predecessor of the (Wuhan) Institute of Surveying and Geophysics was the Geodesic Survey Group of the Institute of Geography founded in Nanjing in 1951. It was moved to Wuhan in 1958 for establishment of the Surveying and Cartography Institute. It was combined with the Upper Atmosphere Research Office and the Hubei Institute of Machinery in 1961 and changed to the Surveying and Geophysics Institute. It was shifted later to the Wuhan Seismology Brigade. Some scientific research personnel of the Wuhan Seismology Brigade were moved out in 1978 to reestablish the Institute of Surveying and Geophysics. It has four research offices: the Gravitation and Solid Tide Research Office, the Astronomy and Geodesy Research Office, the Technical Research Office, and the Information Research Office. The institute has 146 employees including 9 advanced research personnel and 42 assistant researchers and engineers.

The institute currently is involved mainly in basic and applied research on geodesic surveys, earth gravity, solid tides, error theory, polar migration, and the earth's rotation.

The main achievements of the institute since its establishment include those during the early period, when it worked with the State Cartography Bureau to formulate a gravitational survey program for China and participated in establishment of gravitational base points, formulating programs for astronomical and gravitational standards for China, suggesting methods for processing astronomical and gravitational calculations, participating in determination of China's astronomical longitudinal base points and providing methods for utilizing full-function transit T_4 contact micrometers for time measurements according to the equal altitude method. As the space sciences have developed, the institute has studied and extrapolated preliminary corrections in China's earth core coordinates. They have completed extrapolation programs for gravitational anomaly fields in space and upper atmosphere interference sites and they have used satellites in conjunction with surface gravitational data to derive global gravitational fields. They also have made excellent achievements in research concerning quasistable adjustment methods for deformation detection, approximation of Stokes' function, truncation error estimates, and other theoretical questions. In recent years, they completed surveys of coastal gravitational tide cross sections and made definite achievements in the interaction between oceanic and solid tides and theories concerning tidal deformation of an elastic earth. They have been successful in developing radio altimeters, radio locators, perpendicular observational devices, marine quartz gravimeter standard electronic reading and recording equipment, and automatic electrical analog quantity recorders. Their publications include DITU TOUYING [MAP PROJECTION] (two volumes), ZHONGLI CELIANG YU DIQIU XINGZHUANG XUE [GRAVITATIONAL SURVEYING AND STUDY OF THE SHAPE OF THE EARTH] (two volumes), WUCHA LILUN [ERROR THEORY], and other books and they also publish CELIANG YU DIQIU WULI JIKAN [ARTICLES ON SURVEYING AND GEOPHYSICS].

Honorary director: Fang Jun [2455 0193]

Director: Xu Houze [6079 0624 3419]

Party secretary: Shi Hanxiong [2457 3352 7160]

Address: Xiaohongshan, Wuchang District, Wuhan

Telex: 5112

Telephone: 72963

(Wuhan) Institute of Hydrobiology

The Institute of Hydrobiology was established in 1950. Its predecessor was the Central Research Academy Institute of Zoology and Botany established in Nanjing in 1934. It was moved to Wuchang District of Wuhan City in Hubei Province in 1954 and engaged exclusively in freshwater hydrobiology. The institute now has 428 employees including 228 S&T personnel (5 researchers, 19 assistant researchers, 1 assistant editor, and 138 middle-level personnel). The institute has seven research offices for fish taxonomy, fish genetics and breeding, fish diseases, ecology, algal taxonomy, aquatic pollution hydrobiology and reservoir fishery, and it has a freshwater dolphin research group. In addition, it also has a technical office, an editing and translating office, a library, a fish specimen office, and a breeding experiment station. Its primary tasks are to study the life phenomena of aquatic organisms and their interrelationship with the environment. The main orientation is toward inland hydrobiological ecology (including experimental ecology) and the corresponding development of research on hydrobiological genetics and breeding, diseases, taxonomic systems, evolution, and aquatic pollution biology.

The institute has made more than 400 S&T achievements over the past 30-plus years, including nearly 60 very important achievements. It has done a great deal of basic theoretical research at a rather advanced scholarly level concerning morphological classification, regional distribution, and systems evolution for freshwater fish, algae and invertebrates. The institute has integrated with comprehensive investigation of China's resources and linked up with large-scale water conservancy construction for a systematic survey of aquatic organisms in rivers, lakes, reservoirs, and the Qinghai-Xizang Plateau to provide a scientific foundation for the development, utilization and protection of hydrobiological resources. They have developed research in the field of fish diseases and experimental algal biology and made gains in the areas of fish disease prevention and nitrogen fixing blue-green algae as a fertilization source for late rice. They have employed genetics and cytology and introduced domestication technologies to domesticate and breed new breeding counterparts for Tuantou [0957 7333] bream (Wuchang fish), fine-scaled Xiehe [2438 9577] fish, hybrid carp, mixed-breed silver crucian carp, and other improved fish varieties, and they have been extended in raising throughout China. Research on freshwater ecology to provide comprehensive technical measures for lake fishery production has led to obvious increases in output. They began research in the 1970's on aquatic pollution ecology, toxicology, and control measures in polluted water. They accumulated and used experiences in three-stage oxidation ponds to purify pesticide waste water and studied the purification mechanisms of aquatic organisms.

Honorary director: Wu Xianwen [0124 3759 2429]

Director: Liu Jiankang [0491 1696 1660]

Party secretary: Sang Yixiu [2718 3015 0208]

Academic Committee chairman: Liu Jiankang

Address: Luojiashan, Wuchang District, Wuhan

Telex: 3225

Telephone: 75588 72120

Wuhan Institute of Botany

The Wuhan Institute of Botany was established in 1956. It was called the CAS Wuhan Botanical Gardens when first established and focused on botanical resource surveys, introduction and domestication and park construction. It was changed to the Hubei Province Institute of Botany in 1972. In 1978, it became the CAS Wuhan Institute of Botany. It has research groups and botanical gardens for plant taxonomy, ecology, geobotany, plant biology technologies, medical botanical chemistry, plant oil production, plant proteins, plant genetics and breeding, freshwater algae taxonomy, cytology, yangtao [*Actinidia chinensis*] applications, selection of natural fruit decay prevention agents, etc. It now has 240 employees including 109 S&T personnel (6 advanced S&T personnel and 61 middle-level personnel). It has about 60 hectares of land, more than 150,000 waxed leaf specimens and about 3,000 types of plants under cultivation.

On the basis of research concerning regional botanical systems in central China, the institute has surveyed, explored, utilized, protected and domesticated the botanical resources of central China, and they have gradually developed research on aquatic botany. They have joined with agricultural, forestry, horticultural, industrial, medical, and other units for applied and developmental research. They also have carried out basic theoretical research in fields related to botany. They currently are involved in research concerning resource botany in central China, aquatic higher plants, introduction and domestication of economically valuable Chinese and foreign plants, research on plant genetics and breeding, experimental research on applications of new breeding and cultivation technologies, research on the chemical components of plants and plant resource utilization, research on plant taxonomies in central China, regional, resource and vegetation surveys, systems evolution laws, and other topics.

The institute has made 31 important S&T achievements over the past 20-plus years. The most prominent ones are a botanical resource survey of Shennongjia, research on the chemistry of *Shennong crossotephium chinense* and its applications, a yellow ginger resource survey, manufacture of various types of amino acids from cottonseed cake, research on plant molting hormones, breeding olive tree cuttings, cultivating improved varieties of lotus root, etc.

Director: Hu Hongjun [5170 7703 6874]

Party secretary: Liu Yunkui [0491 0061 7608]

Academic Committee chairman: Hu Hongjun

Address: Moshan, Wuchang District, Wuhan

Telex: 5600

Telephone: 70126 70251

Wuhan Scientific Instruments Factory

The Wuhan Scientific Instruments Factory was established in 1958. It now has 240 employees including 60 S&T personnel. It has a technical development department, a management services department, a metalworking shop, an electronic installation and adjustment workshop, and other professional organs.

Before 1978, the Wuhan Scientific Instruments Factory mainly served the various institutes of the CAS. It began producing various types of scientific instruments needed in production and biological engineering in 1978 to provide biological services to the CAS. They began trial manufacture of the GL-18 high-speed cooling centrifuge in November 1978 and finalized the design and put it into production in April 1982. They now have completed production of five varieties and nine models of instruments including nine models of high-speed cooling centrifuges and matching rotors, a brush electroplater, the HYA constant temperature rocking bed, quick rapeseed quality testers, and electrophoremeters.

Director: Dong Wensheng [5516 2429 3932]

Party secretary: [blank]

Academic Committee chairman: Dong Wensheng

Address: Xiaohongshan, Wuchang District, Wuhan

Telex: 6022

Telephone: 72327

Wuhan Library

The Wuhan Library was established in 1956 and originally was called the CAS Wuhan Branch Library. During the Cultural Revolution, it was combined with the Hubei Province Scientific and Technical Information Institute. It was reestablished in June 1978 and in 1981 was renamed the CAS Wuhan Library and placed under direct CAS leadership. It now has 77 employees including 1 advanced researcher and 14 middle-level personnel. Its holdings exceed 1.4 million volumes. It has an acquisitions and cataloging office, a periodical department, a reading circulation department, a technical office, an information office, and other professional organs.

The library mainly integrates with the scientific research orientations of the various CAS institutes in the Wuhan region to collect, catalog, preserve and provide Chinese and foreign S&T publications, to provide relevant S&T information, to coordinate published information work in the various institutes, and to organize academic activities and exchanges of experience.

Since its establishment, the library has used various means to collect more than 46,000 types of Chinese and foreign periodicals (including more than 500 original editions) in mathematics, physics, chemistry, astronomy, geology, biology, and other fields. It has received more than 120,000 visitors and loaned out more than 160,000 books, and it has provided 13,120 specific titles for scientific research projects. The library has published a large number of works including KEXUEXUE WENXUAN [SELECTED ARTICLES ON SCIENTIOLOGY], MIHOUTAO ZILIAO XUANJI [SPECIAL INFORMATION EDITION FOR YANGTAO (*Actinidia chinensis*)], LIANGZI SHENGWUXUE YU LIANGZI YAOWUXUE SUOYIN [INDEX OF QUANTUM BIOLOGY AND QUANTUM PHARMACOLOGY], ZHUYAO MIANHUA HAICHONG TILU [CATALOG OF PRIMARY COTTON INSECT PESTS], etc., and it publishes the periodicals KEXUE JINZHAN [SCIENTIFIC PROGRESS], KEJI XINXI [S&T INFORMATION], XIN JISHU GEMING XINXI [INFORMATION ON THE NEW TECHNOLOGICAL REVOLUTION], and other periodicals. The library has translated a substantial number of foreign publications including those related to quantum biology, viral taxonomy, bio-engineering, guayule [*Parthenium argentatum*], etc. In the area of library management, they have developed computer programs to manage the circulation of publications with 21 functions including lending, returns, lending extensions, forecasts, loss notification, expedited returns, statistics, searching, etc. Moreover, they have been active in preparing for experiments and computer applications in document searches.

Director: Cai Jiawen [5591 0857 2429]

Party secretary: Cai Jiawen

Address: Xiaohongshan, Wuchang District, Wuhan

Telex: 4350

Telephone: 71657

Changsha Institute of Geotechnics

The predecessor of the Changsha Institute of Geotechnics was the CAS South Central Geotechnics and Geochemistry Research Office that was established in 1961. It was disbanded in 1970 but was reestablished in 1975 as the Hunan Institute of Geotechnics. It was returned to the CAS in 1978 and given its present name.

The institute is involved mainly in research on China's diwa (geodepression) theory [developed by Chen Guoda [7115 0948 6671] in 1956] and in applying diwa theory to study China's regional geotechnic characteristics, and they have developed research on historical and mineral product formational conditions and distributional regularities in service to mineral exploration. The institute now has a staff of 100. It has three research offices for structure and mineralization, sedimentary structures and mineralization, and magmatic structures, structural geochemistry and mineralization, and it has a central laboratory and an information editing and translation office. It publishes ZHONGGUO KEXUEYUAN CHANGSHA DADIGOUZAO YANJIUSUO JIKAN [COLLECTED ARTICLES FROM THE CAS CHANGSHA INSTITUTE OF GEOTECHTONICS], DADIGOUZAO YU CHENGKUANGXUE [GEOTECHTONICS AND MINERALIZATION] (a quarterly, published openly in China and abroad), GUOWAI DADIGOUZAO YU CHENGKUANGXUE [FOREIGN GEOTECHTONICS AND MINERALIZATION], and other periodicals.

Since its establishment, the institute has been involved mainly in research on China's regional geotechnics, structural geology, seismic geology, mineralization structures and laws of mineralization, and they have been especially active in research on long-range energy and resource forecasting, exploration and development, and other areas.

The main accomplishments are ZHONGGUO QUYU DADIGOUZAO JIBEN TEZHENG QUBU ZHONGJIE [A PRELIMINARY SUMMARY OF CHINA'S BASIC REGIONAL GEOTECHTONIC CHARACTERISTICS], DIWAQU-DALU DIKE DISAN GOUZAO DANYUAN [THE DIWA (GEODEPRESSION) REGION—THE THIRD STRUCTURAL COMPONENT OF THE CONTINENTAL CRUST], the 1:4,000,000 scale ZHONGGUO DADIGOUZAO TU [GEOTECHTONIC MAP OF CHINA] and CHENGKUANG GOUZAO YANJIU FA [MINERALIZATION STRUCTURE RESEARCH METHODS]. In recent years, the institute also has completed DUOYIN FUCHENG KUANGCHUANG [MULTICAUSATIONAL REFORMED ORE DEPOSITS], BEIJIANG DADIGOUZAO YU YOUQI [THE GEOTECHTONICS OF NORTHERN XINJIANG AND OIL AND GAS], HUAXIA XING DIWAQU RUOGAN KUANGCHUANG YANJIU [RESEARCH ON CERTAIN ORE DEPOSITS IN CHINESE-TYPE DIWA (GEODEPRESSION) REGIONS], GOUZAO DIQIU HUAXUE WENJI [COLLECTED ARTICLES ON STRUCTURAL GEOCHEMISTRY], and other works. Since the 1950's began, the research orientation has shifted toward global energy resources, mineral product resources and the formational mechanisms of diwa regions, and they have developed research concerning the geotechnics of western China and oil and gas, diwa basins in eastern China and oil and gas, Cenozoic brown coal in south China, the geochemistry of tin deposits in the Nanling region, and other areas. In addition, the institute participated in research work concerning "research on deep geological structures and mineralization forecasts in Xinjiang."

Honorary director: Chen Guoda [7115 0948 6671]

Director: Huang Su [7806 3936]

Party secretary: Chen Liyu [7115 4409 1785]

Academic Committee chairman: Chen Guoda

Address: Tongzipo, Changsha, Hunan

Telex: 5106

Telephone: 82735

Changsha Institute of Agricultural Modernization

The Changsha Institute of Agricultural Modernization was founded in 1978. Its primary task is to use Hunan Province's Taoyuan County as a model comprehensive scientific agricultural modernization experimental base area and to develop comprehensive scientific research to study the S&T, intermediate testing and applications used during agricultural modernization in similar regions and agricultural economics issues, especially concerning certain comprehensive, advanced and marginal S&T questions. The institute organizes intermediate testing and new technical applications for scientific research achievements.

The institute now has six research offices for resource utilization, agricultural ecology, machine applications in agriculture, agricultural economics, applications of new technologies and physics and chemistry, as well as a printed information office.

Previously developed scientific research work at the institute includes a comprehensive resource survey and agricultural zoning of Taoyuan County, observations of paddy rice ecology, modernized selective breeding techniques, experiments for improvement of gley formation and secondary gley formation in paddy soils, research to develop herbivores in mountainous and hilly regions, paddy field mechanization and new cultivation technologies, high output freshwater fish raising experiments, research on nitrogen cycling and protein production and utilization systems, research on agricultural production structures in hilly and flat regions, research on the economic laws of modernized agriculture.

Acting director: He Dianyuan [0149 7193 3293]

Party secretary: Wu Xiaoming [0702 2556 2494]

Address: Mapoling, Eastern Suburbs, Changsha

Telex: 5001

Telephone: 27320

Advanced Ballot Processing Systems

The vote processing systems used for balloting at the 12th CPC Central Committee, the 6th National People's Congress, and the 6th Political Consultative Conference were developed successfully by the Chengdu Computer Applications Institute. The "JX-2" ballot processing system offers real-time processing, ballot category recognition, automatic selective balloting, automatic monitoring of the work situation at each ballot box, automatic printing and displaying the results of balloting, and other functions with an error rate of less than 1 in 100,000.

Hefei Branch, Chinese Academy of Sciences

The Hefei Branch of the Chinese Academy of Sciences is an agency of the CAS located in Anhui that administers four institutes in the Anhui region: the Anhui Institute of Optics and Fine Mechanics, the [Hefei] Institute of Plasma Physics, the Solid State Physics Institute, and the Hefei Institute of Intelligent Machines.

The branch now has 2,291 employees including 33 advanced research and technical personnel and 482 middle-level personnel. Organs in the branch include an office, a cadre office, and other offices, and they employ 492 people.

Director: Huo Yuping [7202 5940 1627]

Party secretary: Liu Shu [0491 2562]

Advisor: Cai Chengzu [5591 2110 4371]

Address: Dongpu, Hefei

Telex: 0433

Telephone: 73515

Anhui Institute of Optics and Fine Mechanics

The Anhui Institute of Optics and Fine Mechanics was founded in 1970. It now has 1,030 employees including 467 S&T personnel (9 advanced researchers, 2 advanced engineers, 117 assistant researchers, and 118 engineers). It has nine research offices, one development department, and one subsidiary factory. The research offices cover the areas of laser spectroscopy, atmospheric optics, gas lasers, new types of lasers, laser crystals, nonlinear crystals, solid lasers, and printed information. The institute also has established a micro-computer applications technical development group. A group of laboratories with fairly advanced technologies have been set up, like a cross-molecular beam spectrographic laboratory, a molecular vibration laboratory, a multi-nucleus molecular standard laser laboratory, an adjustable harmonic super-pulse laser laboratory, a remote sensing geophysics laser laboratory, etc. The primary direction of scholarly development in the institute is laser spectroscopy, atmospheric optics, new types of lasers and their applications, and fundamentals of remote sensing technologies, and it is engaged in applications and development work for laser and optical technologies.

Since its establishment, the institute has made almost 100 S&T achievements, 10 of which have received major achievement awards from the National Science Conference, the National Defense Science, Technology, and Engineering Commission, or the CAS. They have published openly more than 100 scholarly articles each year over the past several years including about 50 that have been published in Chinese and foreign middle-level and higher scholarly publications or presented at national scholarly conferences.

The institute recently adopted an open-door principle. Within China, it has established cooperative relationships with more than 20 institutions of higher education and institutes for topical research and training graduate students, and it has set up broad-based linkages with local enterprises to extend S&T achievements. In foreign contacts, the institute has established bilateral cooperative relationships for joint development of three research projects on laser spectroscopy and molecular standard lasers with the Max Planck Society's Institute of Quantum Optics in West Germany. The institute welcomes Chinese and foreign scholars to come and lecture, for short-term work or long-term cooperation.

Director: Liu Songhao [0491 7313 6275] (concurrent)

Party secretary: Tang Honggao [3282 3163 7559]

Academic Committee chairman: Liu Songhao

Address: Dongpu, Hefei

Telex: Hefei 0007

Telephone: 73515 transfer

Hefei Institute of Plasma Physics

The Hefei Institute of Plasma Physics was established formally in September 1978. Its predecessor was the Controlled Thermonuclear Reaction Experiment Station of the CAS Anhui Institute of Optics and Fine Mechanics that was established in 1974. It now has 493 employees including 323 S&T personnel (2 researchers, 3 assistant researchers, 4 advanced engineers, and 215 assistant researchers and engineers). It has 10 research offices, a subsidiary factory, and a technical center.

The institute's main focus and tasks concern high-temperature plasma physics experiments and theoretical research and medium- and small-scale nuclear fusion facilities, and it has used various routes to develop research on the shape of magnetic fields and unusual plasma heating methods to explore improved routes for magnetically controlled fusion. It also is engaged in research on new technologies related to nuclear fusion. Examples include diagnostic measurement and data processing, high-power ion sources and neutral particle beam technologies, microwave heating technologies, intense magnetic fields, high-power pulse power sources, superhigh vacuum, low-temperature superconductors, etc.

The capital construction project at the institute now is basically complete and four DC flywheel generators with a total power of 80,000 kw have begun operation. Installation of the 2.4 million kilocalorie/hour capacity cooling systems and the deionized water, heat supply, and other equipment is complete. The automatic design and processing (Tokamaka) HT-6 and HT-6M equipment has been completed. The conditions for medium- and small-controlled research now basically are in place. Research on high-temperature plasma physics now is in progress. Other research achievements made in the institute since its establishment include: 400,000 gauss pulse magnets, welding in large profile copper pipe, Camac data collection systems, 7-cm ion sources and injection systems, various types of diagnostic systems for fusion equipment, etc. In addition, the institute has cooperated with other units to complete TE-R summer thunderstorm detectors, stainless steel nonmagnetic welding rods, etc.

Director: Huo Yuping [7202 5940 1627] (concurrent)

Party secretary: [blank]

Academic Committee chairman: Huo Yuping

Address: West end of Dongpu Island, Hefei

Telex: 4418

Telephone: 73515, extension 309

Institute of Solid State Physics

The Institute of Solid State Physics was established formally in March 1982. its work focuses mainly on new structural materials (including improvement and exploitation of the potential in traditional structural materials) and carries out research concerning solid state defects and mechanical qualities, and it is preparing to develop cross-disciplinary research through links with chemistry, biology, and geology, to strengthen cooperation with the relevant units in China and in foreign countries, and to establish linkages with industrial departments, factories, and mines to form a new open institute. In the early period after it was founded, the institute mainly studied the solid state mechanical qualities of the defect state, glass state (noncrystalline state), surface state, and molecular state. Furthermore, they also are working to develop research concerning laser and synchronous radiation in solid state physics. The materials used in this institute include metals and metal alloys, polymer composite materials, cement materials (with increased flexibility) and ceramic materials (with greater pliability), organic materials, etc.

The institute has begun to complete a group of fairly modern laboratories capable of microscopic examination, structural and compositional analysis, and physical property testing. Its Solid State Internal Dissipation Laboratory has attained advanced international levels and made several innovative research achievements. The institute has a two-tier institute and topical group system. There are no research offices in the research system, only topical groups. It also has set up public laboratories and technical systems that are open to serve all relevant units within the institute.

Director: Ge Tingsui [5514 1656 3606]

Party secretary: Yao Minjun [1202 3046 6511]

Academic Committee chairman: He Yizhen [0149 1837 6297]

Address: Dongpu Island, Western Suburbs, Hefei

Telex: 0942

Telephone: 73515 transfer

Hefei Institute of Intelligent Machines

The Hefei Institute of Intelligent Machines was founded in October 1979. It was established on the basis of personnel in the former CAS East China Automation Institution who were engaged in research on automation components, instruments, and systems. It now has 148 employees, including 108 S&T personnel (3 advanced researchers and 61 middle-level researchers).

The scientific focus of this institute is on information detection science and it is engaged in research concerning artificial intelligence sensory systems and components, artificial intelligence system theory and technology, and its content includes: research on sensitive components, new types of sensors, detection technologies and equipment, and on applications of machine intelligence in detection technologies.

The main achievements of the institute since its establishment are: gas ultrasonic flow meters, the AZN-1 noninjurious fixed parameter hemodynamics rheologic analyzer, PN composition and small foil gauges, intracranial pressure monitors, dual-axis textile stretching test equipment, equipment to process shear data, antenna discrimination systems, and Chinese character microcomputer enterprise management system guides.

Director: [blank]

Party secretary: [blank]

Academic Committee chairman: Chen Xiaoken [7115 2400 5146]

Address: Meishan New Village, Sanli'an, Daximenwai, Hefei

Telex: 2535

Telephone: 63875

China's First Laser

Lasers are now being used throughout industrial processing, distance measuring, laser information transfer, holography, agriculture and breeding, medicine, and other areas. The world's first laser came into being in the early 1960's. One year later, in September 1961, China's first laser was built at the CAS Changchun Institute of Optics and Fine Mechanics. This institute has made contributions to research and applications in the optics and fine mechanics fields, and it has become China's main base area for research on optics and fine mechanics.

China University of Science and Technology

The China University of Science and Technology is a comprehensive university of science and engineering that was established in 1958 at its original site in Beijing in accordance with the principle that "the academy should establish a university to integrate the institute system." It was moved to Hefei City in Anhui Province in 1969 and placed under dual leadership by the CAS and Anhui Province, with the CAS being the primary leader. The university has 41 disciplinary orientations in 13 departments and youth classes in the fields of mathematics, physics, modern chemistry, modern physics, modern mechanics, radio and electronics, earth and space sciences, biology, precision machinery and precision instruments, systems science and management science, computer science and technology, applied chemistry and engineering thermophysics. Most of the disciplines are in the emerging technologies and marginal sciences. The university also has 61 teaching laboratories, 48 scientific research organs, and 7 school-run factories. It has a total of 1,753 teaching and scientific research personnel, 79 professors with joint appointments, more than 3,000 undergraduate students and more than 568 graduate students in the Hefei Graduate Student Department. The scale of development is 4,000 undergraduates and 2,000 graduate students. The curriculum for undergraduates lasts 5 years and that for graduate students lasts 2 to 3 years. After enrolling, the [undergraduate] students spend their first 3 to 3.5 years in basic classes and specialized basic classes. They select topics related to their specializations for the last 1.5 to 2 years and go to the CAS or other scientific research departments to participate in scientific research practice. Graduate students now are admitted in 45 orientations, including 14 PhD training areas and 31 MS training areas.

More than half of the graduates from the university take examinations for admission as graduate students in China and abroad each year. The university has accepted 231 superintelligent youth between the ages of 11 and 15 in 7 classes since 1978 and is providing special training for these young people.

The university has assigned more than 10,000 high-quality S&T personnel to the state since its founding. The China University of Science and Technology is an educational center as well as a scientific research center. More than 200 scientific research achievements have been made in various fields in the past several years and more than 3,000 scientific articles have been published in China and in foreign countries. The school currently is involved in classroom and dormitory expansion and staff renewal. Besides the existing campus, they are opening up new areas to establish campuses for research-type educational regions that will include advanced experimental equipment like the State Electronics Synchronous Radiation Laboratory to carry out advanced age specialized instruction and graduate student instruction with a focus on the technical sciences.

Honorary director: Yan Jici [0917 3444 1964]
Director: Guan Weiyan [4619 1919 3508]
Party secretary: Yang Haibo [2799 3189 3134]
Address: Jinzhailu, Hefei City, Anhui
Telex: 4430
Telephone: 63300

Xinjiang Branch, Chinese Academy of Sciences

Preparations for construction of the Xinjiang Branch of the CAS began in 1956 and it was formally established in 1960. It was placed under leadership of the Xinjiang Autonomous Region in 1970 and returned to the CAS in 1977.

The Xinjiang Branch is an agency of the CAS that administers five CAS research institutes (and stations) in the Xinjiang region: the Xinjiang Institute of Physics, the Xinjiang Institute of Chemistry, the Xinjiang Institute of Biology, Pedology, and Psammology, the Xinjiang Institute of Geography, and the Urumqi Satellite Observation Station. It also manages the branch's scientific instruments factory and library.

The various units under the Xinjiang Branch employ 1,018 people of 12 nationalities, including 643 S&T personnel (32 advanced researchers and 172 middle-level researchers).

The primary orientation of the Xinjiang Branch is toward economic construction in Xinjiang. They are engaged in comprehensive surveys of the water, soil, and organic resources, development and renovation of the national territory, desert transformation, prevention of snow damage, computer applications, semiconductor sensitive materials and sensors, radiation physics, oilfield chemistry, applied microbiology, biochemistry, remote sensing and cartography, solar chromosphere observations, and other research.

Director: Mao Dehua [3029 1795 5478] +

Party secretary: Wang Guifang [3769 2710 2455]

Advisors: Chen Shanming [7115 0810 2499], Ha Lin [0761 3829], and Qiao Jianhai [0829 1696 3189]

Address: Beijnglu, Urumqi

Telex: 4282

Telephone: 38330

Seedless Watermelons

It is hard to develop seedless watermelons, their seeds germinate at a low rate and the sprouts grow very slowly during the early stages, so significant expansion in this area has been difficult. The CAS Beijing Institute of Botany and Shanghai Institute of Plant Physiology adopted an organized cultivation method to develop an excellent strong and disease-resistant clone. They studied and established a full set of methods for fast reproduction and industrialized seedling raising for seedless watermelons that can be cultivated over a large area in the near future.

Xinjiang Institute of Physics

Preparations for construction of the Xinjiang Institute of Physics began in 1959 and it was formally established in November 1961. It was placed under the leadership of the Xinjiang Autonomous Region Science Commission from 1971 to 1978. The Xinjiang Branch of the CAS was reestablished in April 1978 and this institute was placed under the CAS. It now has 188 employees, including 134 research and technical personnel (3 assistant researchers and 43 middle-level research personnel). It has research offices (and stations) for isotope applications, semiconductors, applications of electronic technologies, wind energy utilization, and other areas.

In the early period after its founding, the institute was involved mainly in development of isotope applications and semiconductor heat sensitive resistors. After 1971, it took up research on radiation physics, semiconductor sensitive materials and sensors, electronic computer applications, and other topics.

The institute has made 66 scientific research achievements over the past 23 years, including 17 topics that received awards from various science commissions and scientific research achievement awards. An example is the development of more than 10 types of heat sensitive components with specifications ranging from 1°K to 1,000°C, including 4 items that filled in blanks within China and 5 that reached the level of identical foreign components. New paths have been opened in automatic computer controlled cooling systems, GDY automatic spectrum analyzers and microcomputer applications in optimum control systems for coke oven heating. Their research on radiation physics has filled in gaps within China in the field of applied physics. First stage results have been obtained in research on CMOS radiation effects, and pleasing achievements have been made in research on normally-structured hydrocarbon sulfoxide.

Director: [blank]

Party secretary: Tao Guoqiang [7118 0948 1730]

Academic Committee chairman: Shen Lansun [3088 5695 5549]

Address: Beijinglu, Urumqi

Telex: 3811

Telephone: 38623

Xinjiang Institute of Chemistry

Preparations for construction of the Xinjiang Institute of Chemistry began in 1958. It was called the Chemistry Laboratory during its earlier period but was formally established as the Xinjiang Institute of Chemistry in 1962. It now has 131 employees, including 91 S&T personnel. It has five research offices for surface activators and surface chemistry, biochemistry, natural organic and analytical chemistry, central experiments, and technical equipment, and it has a biochemical reagent workshop.

The institute focuses on the needs of construction in the Xinjiang Autonomous Region and deals with key scientific and technical issues in the development and utilization of agricultural and animal husbandry resources and petroleum resources for research in organic chemistry and biochemistry. It also is developing the corresponding research in analytical chemistry.

The institute has made 119 S&T achievements over the past 20-plus years and completed 246 scientific and technical articles and reports. Rather important achievements have been made in 15 topics since 1978. Examples include successful development of the AP-17 and Xinjiang No 3 demulsifiers and research on technologies for freezing sheep semen, sheep semen biochemistry, and spermultrastructure. Pleasing advances have been made in petroleum yeast and protein utilization, comprehensive utilization of beet sugar honey and dregs, organization of the development of pancreatin and hydrolyzed whey protein, in approval of antiserum preparations, and in techniques for studying fur dying techniques. In the area of natural chemistry, the institute has developed research in accordance with resource characteristics and regional needs and made rather good achievements in areas like research on light diesel gasification to manufacture hydroxyl acids and naphthenate, separation, preparation, and utilization of triactonal, synthesis of apple moth sexual pheromones and their applications, botanical chemistry, etc.

Director: Bo Tayi [0130 1044 0181]

Party secretary: Pan Zhonggan [3382 0112 1344]

Academic Committee chairman: Chen Shanming [7115 0810 2494]

Address: Beijinglu, Urumqi

Telex: 1331

Telephone: 38213

Xinjiang Institute of Biology, Pedology, and Psammology

The Xinjiang Institute of Biology, Pedology, and Psammology was established in 1961 under its original name, the Xinjiang Comprehensive Institute for Soil and Water Organic Resources. In 1965, the institute's Geography Office was combined with the Geology Office of the Xinjiang Branch of the CAS to form the Xinjiang Institute of Geology and Geography. Its name was changed to the Xinjiang Institute of Biology, Pedology, and Psammology in 1974. It has five research offices for botany, zoology, microbiology, pedology, and psammology, two grasslands research stations, a central technical office, an information office, and an editorial office for GANHAN QU YANJIU [RESEARCH ON ARID REGIONS]. It now has 227 employees, including 175 S&T personnel (10 advanced S&T personnel and 64 middle-level S&T personnel).

The institute uses Xinjiang as a model for systematic development of exploration of the biological, pedological, and psammological characteristics and successional regularities in China's arid regions. It also does intensive research on the regional distribution of the area's natural resources and on quantitative and qualitative evaluations for rational development and utilization to carry out survey research and develop fixed site experiments focusing on desert transformation, controlling soil alkalinity and salinity, pasture improvement, and other major issues to accumulate data and summarize regularities. In the development of Xinjiang, the institute has assumed responsibility for organic and soil resource development, improvement and control of deserts, saline-alkaline soil and pastures, special melons and fruits, and other scientific research topics.

Some representative scientific research achievements of the institute since its establishment include comprehensive surveys of Xinjiang's wasteland resources, surveys of territorial renovation at Luobupo, Tuomuer Peak and Bayangol Monggol Autonomous Prefecture, remote sensing resource surveys of the Tarin He basin, and other activities. They also have done research on special topics like large-scale afforestation for desert control in Turpan, comprehensive control of salinization and alkalization in the large irrigation region in northern Yanqi Hui Autonomous County, grasslands improvement and artificial plans construction in the high Baiyanbulakyar Shan, melon and vegetable storage and preservation, petroleum deparaffinage, acidic proteinase bacterial type screening and applications, and other areas.

Director: Xia Xuncheng [1115 6064 6134]

Party secretary: Zhang Yukun [1728 3768 0981]

Academic Committee chairman: Li Shugang [2621 6614 0474]

Address: Beijinglu, Urumqi

Telex: 0060

Telephone: 37276

Xinjiang Institute of Geography

The predecessor of the Xinjiang Institute of Geography was the Geology and Geography Research Office that was founded in 1959. It was expanded in 1961 and renamed the Xinjiang Comprehensive Water and Soil Resources Institute. It was named the Xinjiang Institute of Geography in 1978. It now has 114 employees, including 84 S&T personnel, and it has 5 research offices (water resources, economic geography, geomorphology and the Quaternary era, snow accumulation and remote sensing and cartography), to field experimental stations (the Tian Shan Snow Accumulation Station and the Tarim He Water Equilibrium Station). It focuses mainly on Xinjiang for comprehensive research on geographical and environmental structures, arid region formation and laws of succession, and on rational utilization of natural resources.

Since its establishment, the institute has made 11 very prominent achievements in regional surveys and agricultural zoning work focused on agricultural and natural resources. They include a comprehensive survey of the Yili He basin, agricultural zoning in Xinjiang's Kuqa, Xinhe, Xayar, and Baicheng Counties, prevention of snow damage to the national defense highway in Xinjiang's Tian Shan, comprehensive evaluation and rational utilization of wasteland resources in key areas of Xinjiang, and other topics. Moreover, it has cooperated with other related units for major achievements like a comprehensive scientific investigation of Luobupo, applications of remote sensing technologies in a survey of reed resources in the Bosten Hu region of Xinjiang, etc.

Director: Mao Dehua [3029 1795 5478] (concurrent)

Party secretary: Yang Pinliang [2799 0756 0081]

Academic Committee chairman: Yang Lipu [2799 0448 2528]

Address: Beijinglu, Urumqi

Telex: 0004

Telephone: 38203

New Methane Fermentation Techniques

A new technique for methane fermentation involves separate fermentation of manure and grass and also leads to organic integration of dry and wet tanks. Moreover, tank shapes that conform to technical requirements and are convenient to maintain have been designed. They are safe and easy to use, and improve gas production and raw material utilization rates significantly. This technique has been extended and used in the rural areas of Hunan and has received a major state S&T award. This new technique was developed successfully by the Chengdu Institute of Biology.

Urumqi Satellite Observation Station

The Urumqi Satellite Observation Station was established in 1958 under the jurisdiction of the [Nanjing] Purple Mountain Observatory.

The satellite station was placed under CAS leadership in 1972 and the Xinjiang Autonomous Region served as acting administrator. After the CAS Xinjiang Branch was reestablished in 1978, the satellite station was placed under the leadership of the CAS Xinjiang Branch. It now has 74 employees including 7 advanced and middle-level S&T personnel.

The Urumqi Satellite Observation Station is involved mainly in satellite observations and theoretical research concerning their movements, and in observation and study of the solar chromosphere, sunspot motion, and solar radiation. The satellite station now has seven specialized groups for transit visual observations, dual frequency Doppler observations, mechanics research, time monitoring, solar chromosphere observations, solar radiation, and technology.

Since its establishment, the station has carried out long-term tracking observations for Chinese and foreign satellites and participated in joint surveys of the Xisha [Paracel] Islands and observations of the descent period of the United States' Skylab. It observed China's "triple payload" rocket and the scientific experimental satellite "Shixian [Praxis] 2," and it has used Doppler observations of satellite motion for ground surveys and carried out theoretical research concerning the joint perturbation of the shape of the earth and atmospheric resistance. It has provided the state with a large amount of observational information, including a long-term satellite tracking observation project using the GDJ Transit over 3 consecutive years (1979-1981) that has taken first place in visual observation among the CAS satellite system.

Director: Huang Zhen [7806 2823]

Party secretary: Yang Rupiao [2799 3067 2613]

Academic Committee chairman: Huang Zhen

Address: Beijinglu, Urumqi

Telex: 2502

Telephone: 38284

Lanzhou Branch, Chinese Academy of Sciences

The Lanzhou Branch is an agency of the Chinese Academy of Sciences that administers the six institutes and one laboratory of the CAS in the Gansu region: the (Lanzhou) Institute of Modern Physics, the Lanzhou Institute of Chemical Physics, the Lanzhou Institute of Glaciology and Cryopedology, the Lanzhou Institute of Deserts, the Lanzhou Institute of Plateau Atmospheric Physics, the Lanzhou Institute of Geology, and the Lanzhou Library, and it acts on the academy's behalf in administering the Qinghai Institute of Saline Lakes and the Northwest Plateau Institute of Biology located in Qinghai.

The Lanzhou Branch now has 3,666 employees including 2,760 S&T personnel (106 advanced research and technical personnel and 956 middle-level personnel). There are 318 people working in organs of the branch and in the organs under it.

Director: Guo Shangping [6753 1424 1627]

Party secretary: Fan Zhanjiang [2868 0594 3068]

Advisors: Dong Jie [5516 2638] and Wang Weiqu [3769 4850 4388]

Address: 25 Nanchanglu, Lanzhou

Telex: 5604

Telephone: 25310

(Lanzhou) Institute of Modern Physics

Preparations for construction of the Institute of Modern Physics began in 1957 and it was called the CAS Lanzhou Physics Research Office at the time. It was combined with the Lanzhou Electronics Office in 1962 to form the CAS Institute of Modern Physics. It was placed under the jurisdiction of the Second Ministry of Machine Industry for a time but was returned to the CAS at the beginning of 1973.

The institute now has 905 employees and 601 S&T personnel, including 29 advanced S&T personnel and 350 middle-level S&T personnel. It has 10 research offices for nuclear physics experiments, nuclear theory, applications of nuclear technologies, and other fields, and it has 8 engineering offices for magnetic fields, high frequency vacuum, etc., that are responsible for heavy ion accelerator construction. In addition, it also has a library and information office and a technical safety and protection group.

This institute is engaged mainly in research on low energy nuclear physics. Before 1970, it mainly was involved in developmental research in the area of light nucleus reactions and neutron physics. After 1973, the research focus shifted to heavy ion nuclear physics, and they also opened several research topics on applications of nuclear technologies. They also have carried out the corresponding development of nuclear electronics instruments and various types of detector components, data collection in nuclear physics experiments, computers and accelerator technologies, and other work. In addition, the institute uses accelerator beams to prepare more than 10 types of radioactive isotopes.

The institute made 317 scientific research and technical achievements between the time of its founding and the end of 1983, and 63 topics have received state natural science awards and CAS, National Science Conference, and Gansu Provincial Science Commission scientific and technical achievement awards. It has published 194 articles in relevant Chinese and foreign scholarly journals.

Honorary director: Yang Dengzhong [2799 3397 0022]

Director: Wei Baowen [7614 1405 2429]

Party secretary: Wang Yuying [3076 3768 3841]

Academic Committee chairman: Yang Dengzhong

Address: 27 Nanchanglu, Lanzhou

Telex: 6602

Telephone: 28951

Lanzhou Institute of Chemical Physics

The Lanzhou Institute of Chemical Physics was established in 1958 when some of the personnel studying natural petroleum in the Dalian Petroleum Institute were moved to Lanzhou. It was the Lanzhou Branch of the CAS Institute of Petroleum at that time. It was combined with the former Lanzhou Chemistry Research Office in 1962 and renamed the CAS Lanzhou Institute of Chemical Physics. It now has seven research offices for analytical chemistry, solid lubrication, synthetic chemistry, multiphase catalysis, light-aided catalysis, complex catalysis, and technical equipment, and it also has a testing center office and a maintenance and assembly plant. At present, the institute is engaged mainly in research concerning molecular catalysis, solid lubricating materials, bionic organic synthesis, modern analytical chemistry, and structural chemistry, and it also does theoretical research on surface chemistry related to multiphase catalysis and solid lubricating materials.

The institute's primary research achievements since its founding are: ZHONGGUO SHIYOU QINGLIUFEN FENXI [ANALYSIS OF LIGHT FRACTIONS IN CHINA'S PETROLEUM], butene oxide dehydrogenation to make butadiene catalyst and its reaction techniques. The institute also developed an ablation-resistant additive for Chinese-made aviation kerosene, special types of lubricating materials, special paints, liquid materials with special mechanical and electrical properties, selective gas permeable membrane materials, potassium (sodium and lithium) ion selective electrodes, isobutylene low pressure aldehydation reactions and propylene low-pressure oxo-reaction manufacture of butanol, and it has developed high-speed ion exchange chromatographs and a combined gas phase chromatograph-microwave plasma quantometer.

Director: Wang Hongli [3076 1738 4539]

Party secretary; Ma Youqun [7456 0645 5028]

Academic Committee chairman: [blank]

Address: Lanzhou

Telex: 4496

Telephone: 22871

Lanzhou Institute of Glaciology and Cryopedology

The predecessor of the Lanzhou Institute of Glaciology and Cryopedology was the CAS High Mountain Ice and Snow Utilization Research Team. The team was combined with the Psammology Office of the Institute of Physics in 1965 to establish the Lanzhou Institute of Glaciology, Cryopedology, and Psammology. It was separated from the psammology section in 1978 and established as a separate institute. The main research focus is on glaciology and cryopedology, and it also does a small amount of research concerning mud-rock flow, Quaternary glaciers and mountainous hydrology, and climate. The institute now has 368 employees including 240 S&T personnel, 18 of them advanced S&T personnel and 120 middle-level personnel.

Over the past 20-plus years, this institute has integrated its scientific research activities with water conservancy, railways, highways, agriculture, energy, and other issues in economic construction. It has made a total of 197 achievements, including 33 that received state, CAS, and local awards. The representative achievements are: engineering measures and designs to prevent snow accumulation and avalanches on the Du-Ku Highway in Xinjiang, research on cryopedological questions in construction of the Qinghai-Xizang Railway, research on cryopedological questions in bitumen road surfacing on the Qinghai-Xizang Highway, research on cryopedological and engineering geology questions in the Juhugeng mining region of Qinghai's Muli Coalfield, evaluation of the stability of industrial and civilian structures, construction well cryopedological engineering geology conditions and mining region water supply conditions, surveys, observation and testing of mud-rock flows near 15 factories in China, changes in the Qilian Shan glacier and research on its utilization, principles and methods of freezing and leak prevention in canal system projects, and other topics.

In addition, the institute also has compiled volumes for Qilian Shan, Altay Shan and other areas in ZHONGGUO BINGCHAUN MULU [CATALOG OF CHINA'S GLACIERS] and provided detailed basic information for formulation of water conservancy and hydropower plans, prevention of mountain floods and mud-rock flow disasters and research on climatic changes in mountainous areas.

Honorary director: Shi Yafeng [2457 7161 7364]

Director: Xie Zichu [6200 5261 2806]

Party secretary: [blank]

Academic Committee chairman: Shi Yafeng

Address: 14 West Dongganglu, Lanzhou

Telex: 0393

Telephone: 26725

Lanzhou Institute of Deserts

The CAS established a Sand Control Team in 1958 to carry out a comprehensive survey of China's large deserts. The Sand Control Team was combined with the CAS Institute of Geography in 1963. This department was moved to Lanzhou in 1965 and combined with the Institute of Glaciology and Cryopedology to found the Lanzhou Institute of Glaciology, Cryopedology, and Psammology. In 1978, the Psammology Research Office was expanded and set up independently to establish the Lanzhou Institute of Deserts. It now has 120 specialized scientific research personnel including 12 advanced S&T personnel. It has five research offices for desertification, sandy region resources, plant sand fixation, chemical sand fixation, etc.

The institute uses deserts and desertified land as a comprehensive ecological environment to forecast developmental trends in natural and artificial processes of environmental change in different regions and comprehensive research on rational resource management and control. The main tasks are in three areas: 1) research on forecasting and controlling processes and trends of desertification; 2) research on principles and measures of fixing moving sand; and 3) research on rational development of agricultural natural resources in desert regions and on environmental changes and means of control following development. In addition, they also do basic psammological research, accumulation of basic information and research on trends in international psammological scientific research. The institute publishes SHAMOSUO JIKAN [COLLECTED ARTICLES OF THE INSTITUTE OF DESERTS], ZHONGGUO SHAMO [CHINA'S DESERTS], SHIJIE SHAMO [WORLD DESERTS], and other periodicals.

Over the past 20-plus years, the institute has focused on comprehensive survey research of natural conditions and natural resources in desert regions to provide a scientific foundation for desert transformation and utilization. In addition, it also has done scientific experiments concerning prevention of wind-blown sand damage to farmland and communications and it has made a rather systematic and scientific summarization of mass experiences in controlling sand. Its more important achievements include: summarization of survey research of China's deserts and a desert distribution map, research on preventing sand damage to farmland and communications, scientific summarization of mass experiences in controlling sand, etc.

Director: Zhu Zhenda [2612 7201 6671]

Party secretary: Chang Liang [1603 0081]

Academic Committee chairman: Zhu Zhenda

Address: 14 West Dongganglu, Lanzhou

Telex: 3097

Telephone: 26720 (central switchboard)

Lanzhou Institute of Plateau Atmospheric Physics

The predecessor of the Lanzhou Institute of Plateau Atmospheric Physics was the Lanzhou Geophysics Research Office that was established in 1958. Its name was changed to the CAS Lanzhou Institute of Plateau Atmospheric Physics in 1974.

The orientation and tasks of this institute are to study the meteorological and climatological effects of the Qinghai-Xizang Plateau, to develop artificial hail elimination experiments and research on cloud physics, and to derive methods for artificial effects on local climates, and to strengthen research on the cloud physics and electricity of weather systems (thunderstorms).

The institute's main achievements since its founding are: 1) many discoveries of cooling and heating source actions and their range of intensity and temporal and spatial distributions in the Qinghai-Xizang Plateau, especially seasonal, daily and weather process changes, plateau climate systems and temporal and spatial changes, plateau weather systems (low temperatures, shear lines, 100 millibar high pressures in Qinghai-Xizang), etc.; 2) it has creatively proposed preliminary two and five level global, hemispheric, global circle and limited region digital forecast models for P-6 mixed coordinates, with rather good results in carrying out numerical experiments for plateau geodesic mechanics and dynamics and thermodynamics, and in digital experiments on the formation of seasonal wind circulation, and the seasonal establishment, interruption, and activation of winds; 3) the institute was the first to propose a theoretical understanding for the effects of temperature changes on climatic changes and pleasing results have been obtained after nearly 10 years of using it in practice to forecast semiannual, seasonal, and monthly precipitation anomalies; 4) the institute was the first in China to propose the use of the frequency of recorded lightning and the intensity, elevation, and reflectivity outlines of strong radar return waves to distinguish between hail clouds and thunder clouds, and rather good extendable results have been obtained using the stability of strata binding, temperature, and other concrete indices to forecast whether or not hail will occur over the next 12 hours and the size of hailstones; and 5) it successfully developed dual channel lightning recorders and hailstone slicers.

Honorary director: Gao Youxi [7559 3945 4406]

Director: [blank]

Party secretary: [blank]

Address: West Dongganglu, Lanzhou

Telex: 3049

Telephone: 25311 (central switchboard)

Lanzhou Institute of Geology

The Lanzhou Institute of Geology was founded in 1960 through expansion of the Lanzhou Geology Research Office of the CAS Institute of Geology. It now has 149 employees, including 11 advanced research and technical personnel and 65 middle-level personnel. The institute has a rather full complement of large-scale instruments and has formed a rather fully outfitted research and technical system for research on resources and materials.

The institute's research is oriented toward the structural components of sediments (the lithosphere) and on their formation and evolution, on the formation, evolution, and distributional characteristics of subsidence zones and sedimentary basins throughout geological history, and on the characteristics of the geodesic structures of northwestern China. It is engaged mainly in research on the formation of petroleum, coal-formed gas and other sedimentary mineral products, on mineralization theory and minerals, environmental protection, and other topics. In addition, it also has developed research in paleontology, isotope geology, mathematical geology, and applications of remote sensing technologies.

The main achievements of the institute since its founding are: comprehensive survey reports on the formational conditions and distributional regularities of continental facies oil and gas in northwestern China and Qinghai Lake, study of the conditions of formation and accumulation of Mesozoic oil and gas in the Ordos Basin, the distribution of sandstone bodies in the Jurassic Yan-9 oil stratum in the Chenghao region, the hydrodynamic conditions of sediments, forecasts of high output zones and other areas. Important progress has been made in recent years in research concerning the geochemical characteristics of coal-formed gas, the formation and evolution of sedimentary basins in western China, evaluation of oil and gas resources in the Jiuxi Basin, and other areas.

Director: Luo Binjie [5012 2430 2638]

Party secretary: Xu Zhengji [1776 2973 4921]

Academic Committee chairman: Luo Binjie

Technical Committee chairman: Xu Yongchang [1776 3057 2490]

Address: 26 West Dongganglu, Lanzhou

Telex: 6347

Telephone: 27981

Lanzhou Library

Preparations for construction of the Lanzhou Library began in September 1955. It originally was a branch organ of the CAS Library at Lanzhou. After its formal establishment in 1975, it was placed under the former CAS Northwest Branch and underwent several name changes later. It was given its present name only when placed under CAS leadership in 1973.

The Lanzhou Library is one of the oldest libraries in all of the CAS's library and information system, and it is among the largest in holdings and has one of the better professional foundations. It is the CAS's northwest scientific and technical information center, focuses on the earth sciences, and is involved mainly in providing printed information for scientific research in the various institutes located in Lanzhou and Xining and for construction of the national economy of northwest China.

The library now has nine functional departments for professional, technical, management, and production systems including an Acquisitions and Cataloging Department, Reader Services Department, Information Research Office, Technical Services Group, Business Office, Printing and Binding Factory, etc. The library has 113 employees including 53 professional personnel and 19 people with advanced job titles. Its holdings exceed 550,000 volumes, including 78,607 volumes of periodicals and 98,004 special editions.

Since its establishment, the library has used exhibitions, lending, reference advice, editing and translating secondary articles, and other service measures and routes to plan an active role in providing printed information for scientific research. It receives about 12,000 visitors each year and circulates about 35,000 publications annually. In addition, it also edits and translates over 60 types of publications. The library has developed information work in recent years and has played a rather good role in national economic construction, especially in development of construction in the "three wests."

Director: Luo Zepu [5012 3419 3184] (concurrent)

Party secretary: Cui Guangli [1508 0342 7787]

Academic Committee chairman: Luo Zepu

Address: 92 Tianshuilu, Lanzhou

Telex: [blank]

Telephone: 23628

Qinghai Institute of Saline Lakes

The Institute of Saline Lakes was founded in 1965. It was established on the basis of the Xi'an Institute of Chemistry of the CAS Northwest Branch and was established by gathering personnel engaged in research on saline lakes in the Beijing Institute of Chemistry, the Lanzhou Institute of Geology, and other units. In 1966, it was combined with the former Institute of Saline Lake Chemical Industry and Comprehensive Utilization of the Ministry of Chemical Industry to establish the present institute.

The Institute of Saline Lakes focuses on research concerning China's saline lakes. It studies routes for comprehensive utilization of saline lake resources, promotes development and utilization of saline lake resources, develops saline lake chemistry, carries out surveys of saline lake resources, and provides scientific theories for applied research concerning new technologies, new methods, and new techniques and for exploration of the basic laws of saline lakes and their development in China.

The institute has six research offices that are involved mainly in research on the geochemistry of saline lakes, the analytical chemistry of salt-forming elements, the physical chemistry of salt-soluble liquids, technologies for separation and extraction of saline lake resources and their comprehensive utilization, research on relevant inorganic functional materials, isotope chemistry, etc.

Since its founding, the institute has made definite achievements in research concerning the distribution of saline lakes on China's Qinghai-Xizang Plateau, in salt formation and evolution, and laws of materialization, in methods to develop solid and liquid mineral ores in saline lakes, in analytical methods for salt and brine, new techniques and methods and basic research for separating and extracting potassium, magnesium, boron, lithium, bromine, iodine, rubidium, cesium, and other salts from saline lake brine and other areas.

Honorary director: Liu Dagang [2692 1129 4854]

Director: Zheng Pengxi [1728 1756 3588]

Party secretary: Li Zi [2621 0745] (concurrent)

Academic Committee chairman: Cheng Jingqing [7115 2417 3237]

Address: Xininglu, Xining, Qinghai

Telex: 3275

Telephone: 55135

Northwest Plateau Institute of Biology

The Northwest Plateau Institute of Biology was established in 1962 on the basis of the CAS Qinghai Branch Institute of Biology. In 1965 some ecology research personnel were transferred from the Beijing Institute of Zoology, the North China Institute of Biology, and other units. The institute was transferred downward to Qinghai Province in the fall of 1970. It was returned to the CAS in 1979. It now has 255 employees, including 164 research and technical personnel.

It has an Ecology Research Office, a Zoology Research Office, a Botanical Research Office, an Agricultural Research Office, a Printed Information Office, and a Technical Office Preparation Group.

During its early period, the institute was involved mainly in research on grasslands vegetation on the Qinghai Plateau, animal and plant classification and regionalization systems, survey research for wild animal and plant resources, and research on the biology of Qinghai Hu naked carp. The current focus is on the Qinghai-Xizang Plateau, study of biological questions linked to the particular natural condition of high elevation above sea level, and development of research work in areas like continental ecology focused in grasslands ecosystems, animal and plant taxonomical classification systems, systems evolution, plateau animal and plant physiology and biochemistry, development and utilization of animal, plant, and soil resources, rodent biology and their prevention, improvement and laws of high output of plateau spring wheat varieties, etc.

The institute has made 108 research achievements since it was founded, the most important ones being: research on rodent elimination and rodent biology, research on the biology of Qinghai Hu naked carp and fishery resources of Qinghai Hu, and development of the spring wheat varieties 506 and 338 with 15 to 20 percent higher yields. The institute has edited two volumes of collected articles, QINGZANG GAORYUAN YAOWU TUJIAN [PICTORIAL HANDBOOK OF MEDICINES OF THE QINGHAI-XIZANG PLATEAU] and GAOHAN CAODIAN SHENGTAI XITONG [HIGH COLD PASTURE ECOSYSTEMS].

Honorary director: Xia Wuping [1115 2976 1627]

Director: Li Jiazao [2621 1367 3416]

Party secretary: Shi Yinzhu [2457 6892 2691]

Academic Committee chairman: Xia Wuping

Address: Xining

Telex: 4430

Telephone: 23282 22855

Chengdu Branch, Chinese Academy of Sciences

The Chengdu Branch of the Chinese Academy of Sciences was established in November 1958 and called the CAS Sichuan Branch. In 1962, the CAS branches in Sichuan, Yunnan, and Guizhou were combined to establish the CAS Southwest Branch. It was dissolved in 1970. The CAS Chengdu Branch was established in March 1978 and some scientific research organs in the former Southwest Branch that had been transferred downward were returned to it. The Chengdu Branch is an agency of the CAS in the Chengdu region that assists the academy in strengthening the scientific research profession, production, and public activities in the various CAS units in the Chengdu region, manages party work and cadre work, and also takes responsibility for planning and building a scientific research base area in Chengdu.

The branch manages seven independent CAS organizations: the Chengdu Institute of Geography, the Chengdu Institute of Biology, the (Chengdu) Institute of Photoelectric Technology, the Chengdu Institute of Organic Chemistry, the Chengdu Institute of Computer Applications, the Chengdu Scientific Instruments Factory, and the Chengdu Library. There are three scientific research organizations under the direct jurisdiction of the branch: the Mathematical Physics Scientific Research Office, the Soil Research Office, and the Analysis and Testing Center.

The Chengdu Branch has a total of 4,348 employees including 2,003 S&T personnel and 1,161 advanced and middle-level S&T personnel. Branch organs and units under its direct jurisdiction have a total of 325 employees, including 194 S&T personnel, with 8 advanced researchers and 88 middle-level research personnel.

Director: Gao Fuhui [7559 4395 2547]

Party secretary: Hou Huiren [0186 1920 0088]

Academic Committee chairman: Liu Yunzhong [0491 0336 0022]

Address: Huaxihouba, Chengdu, Sichuan Province

Telex: 4432

Telephone: 27941 (central switchboard)

China Has the Largest Number of White Cranes in the World

The white crane, a large, almost gray wading bird is a valuable rare animal that has received world attention and has been included among the world's endangered species. After reports in 1933 of surviving white cranes, there had been no sightings since the 1950's. An investigation carried out by the CAS Institute of Zoology over several years discovered 3 surviving white crane colonies with only 230 members in a marshy area on the west bank of Poyang Hu in Jiangxi in the winter of 1980. According to information from India, Iran, and other countries, there are only an estimated 270 to 300 white cranes in the world, so China has 76.7 percent of the total.

Chengdu Institute of Geography

The predecessor of the Chengdu Institute of Geography was the CAS Institute of Geography Southwest Branch that was established in April 1966. It was changed to its present name in January 1978. It now has 296 employees, including 5 advanced research personnel and 124 middle-level S&T personnel. It has four research offices for mud-rock flows, landslips, mountain geography and mountain remote sensing, and cartography, and it has four task offices for printed information, comprehensive analysis and experiments, technology, and editing.

During its early life, the institute was engaged in research on natural geography, geomorphology, economic geography, and mapping. It now studies natural disasters in mountainous regions, with a focus on mud-rock flows and landslips, and it does research on the formation, evolution and rational development and utilization of mountain geography and environments and develops applied research on remote sensing in mountainous areas, and automated map making. The focus in research on mud-rock flow and landslips is on regional characteristics, formational mechanisms, mechanical qualities and laws of motion to provide a scientific foundation, and concrete methods for forecasting and comprehensive prevention. The focus in mountain geography is on exploration of the formation, evolution, and zonal regularities of mountain environments to provide a basis and countermeasures for mountain development and utilization and national renovation. In addition, the institute has integrated research on mountain disasters and mountain environments, and it has developed research on remote sensing in mountainous areas, mountain cartography and mountain information systems, it has compiled remote sensing atlases of mountainous areas, and it has established a mountain information base.

The institute's main accomplishments since its founding include: an investigation of mud-rock flows and landslips on the northern section of the Chengdu-Kunming Railway, comprehensive control of mud-rock flow gullies on Heisha He at Xichang in Sichuan, at Donggou in Xide, at Shizigou in Hanyuan, Nanpinghou Shan, Ya'an'gan Creek, Luwanggou, and other locations, and an investigation of mud-rock flows in Xizang. Since 1973, it has surveyed landslips and mud-rock flows in important earthquake areas of China, studied mud-rock flows in the Yunnan and eastern Sichuan regions and in the Daying Jiang basin and their control, studied the agricultural geography of Sichuan, done a geographical survey of Gongga Shan and a geographical survey of diseases in Sichuan's Ke Shan mountains, carried out research on zinc and the effects of zinc applications in Sichuan's soils, research on the stability of slopes in large water conservancy and hydropower project regions and research on mud-rock flows in Sichuan, compiled a remote sensing atlas of Tengchong, a land utilization atlas for Sichuan, a paddy field atlas, an atlas of Sichuan Province, etc.

Director: Wu Jishan [0702 4480 0810]

Party secretary: [blank]

Academic Committee chairman: Ding Xizhi [0002 6932 4363]

Address: Huaxihouba, Chengdu

Telex: 5174

Telephone: 26257

Chengdu Institute of Biology

The Chengdu Institute of Biology was established in 1958 and at the time was called the CAS Sichuan Branch Institute of Agricultural Biology. It was shifted to leadership by the Sichuan Province CPC Committee and called the Sichuan Province Institute of Biology. In January 1978 it was placed under the dual leadership of the CAS and Sichuan Province, with the CAS as the primary leader, and renamed the CAS Chengdu Institute of Biology. It has eight research offices for plant cytology, botany, genetics and breeding, microbiology, biological resources, environmental microbiology, amphibians and reptiles, and biochemistry. It also has an information office, a central laboratory, an experimental workshop and an experimental farm. It now has 406 employees including 268 S&T personnel (5 advanced S&T personnel and 143 middle-level personnel).

The institute was engaged mainly in research in agricultural biology in its early period. After 1962, it took up research in applied microbiology, botanical resource development and utilization, vegetation surveys, improvement of forage grasses and sheep varieties, improvement of rice, wheat and rapeseed varieties, two-season rice cultivation and classification systems for amphibians and reptiles. It opened up research in molecular biology after 1978. It now is involved mainly in research on biological resources, fermentation microbiology, biologically active materials, environmental microbiology, amphibian and reptile taxonomical classification systems, geobotany, botanical taxonomy, botanical chemistry, plant organization and cultivation, improvement of rice and wheat varieties, biochemistry, and other areas.

The institute has made 129 scientific research achievements since its founding. Of the scientific research achievements made in the last 10-plus years, 22 topics received National Science Commission, CAS, Ministry of Public Health, Sichuan Province of Chengdu City achievement awards. The main topics were: research on methane fermentation, research on applications of the cellulase curve in the brewing industry, a survey of potato resources and research on their comprehensive utilization, research on taxonomical classification systems for amphibians and reptiles, research on microbial fouling in water cycling pipes in large chemical fertilizer facilities, and other achievements. The institute also has published ZHONGGUO WUWEI LIANGQILEI [TAILLESS AMPHIBIANS OF CHINA], SICHUAN YESHENG JINGJI ZHIWU ZHI [SICHUAN'S WILD AND ECONOMIC PLANTS], LIANGQI PAXING DONGWU JIANSUO [RETRIEVAL OF AMPHIBIANS AND REPTILES], ZHONGGUO DE DUSHE JI SHESHANG FANGZHI [CHINA'S POISONOUS SNAKES AND SNAKE INJURY PREVENTION], SICHUAN ZHIWU ZHI [PLANTS OF SICHUAN] (volume one), and other works.

Director: [blank]

Party secretary: Qiu Cuan [0092 0381]

Academic Committee chairman: Zhang Yongdi [1728 3057 0966]

Address: Huaxiba, Chengdu

Telex: 0416

Telephone: 27941-451

(Chengdu) Institute of Photoelectric Technology

Preparations for construction of the Institute of Photoelectric Technology were begun by the National Defense Science Commission in 1969, and the site of the institute was in Dayi County near Chengdu. Some personnel from the Changchun Institute of Optics and Fine Mechanics were brought to the institute in 1973 and the Institute of Photoelectric Technology was formally established under the jurisdiction of the National Defense Science Commission. It was turned over to the CAS in 1975 and renamed the CAS Institute of Photoelectric Technology. It now has 539 S&T personnel, including 305 advanced S&T personnel. It has nine research offices for photoelectric tracking and detection technologies, applied optics and image processing technologies, special optical materials, ultraprecise alignment technologies, television technologies, laser applications, ultraprecise engraving and angle measurement technologies, self-adaptive optics, and information. It also has five trial manufacturing departments for precision machine processing, comprehensive processing, optical processing, optical instruments and equipment, metallic materials and thermal processing, and it has a technical office. The institute is focused on optics and its research mainly concerns self-adaptive optics, photoelectrically-controlled image processing and ultraprecision technologies.

The institute has made 175 scientific research achievements since its founding, including 46 major achievements. Since 1980, it has received second place awards and above from the state, the National Defense Science, Technology and Industry Commission and the CAS for important achievements like near-contact semiautomatic optical engravers, an electron beam exposure machinist parts platform system, the 192 trajectory camera, and other items. In addition, the institute has published 117 scholarly articles in formal publications including 78 articles published in Chinese academic journals and 12 articles published in international journals.

Director: Zhang Litang [1728 4409 1016]

Party secretary: Xu Lianshan [6079 6647 1472]

Academic Committee chairman: Lin Xiangdi [2651 4382 2769]

Address: Dayi County, Sichuan Province and Shuangliu County, Chengdu

Telex: 4430 Chengdu

Telephone: 27941-994

Chengdu Institute of Organic Chemistry

The Chengdu Institute of Organic Chemistry was established in 1958. It now has 432 employees, including more than 310 S&T personnel (6 advanced research and technical personnel and 191 middle-level personnel). It has research offices for complex catalysis, multiphase catalysis, polymer chemistry, precision organic synthesis, analytical chemistry and plasma chemistry, as well as a technical equipment office and a printed information office. It currently is involved mainly in research on catalytic conversion of hydrocarbons, molecular chemistry, precision organic synthesis, analytical chemistry, and other areas.

The institute's main achievements since its founding are: research on natural gas alkyl acetylene manufacture of chloroethylene, a natural gas flame method for manufacturing hydrocyanic acid, a natural gas steam conversion catalyst, new types of neoprene products and polymerization inhibitors, plasma splitting of crude oil to make acetylene, development of an ultrapure hydrogen purifier using a palladium membrane, synthesis of steroid compounds and their use in medicine, and other areas.

Director: Li Guangnian [2621 1639 1628]

Party secretary: Yin Jing [1438 7234]

Address: Huaxihouba, Chengdu

Telex: 0057

Telephone: 27941

Chengdu Institute of Computer Applications

The Chengdu Institute of Computer Applications was established in 1958. At that time, it was run by Sichuan University and called the Institute of Mathematics. It became independent in 1959 and was renamed the CAS Sichuan Branch Institute of Computer Technology. Later, it was placed under the National Defense Science Commission, the Fifth Ministry of Machine Industry, Sichuan Province, and other units. It was returned to the CAS in 1978 and renamed the CAS Chengdu Institute of Computer Applications in August 1979. It now has 261 employees, including 190 S&T personnel, 117 of them middle-level personnel and above. It has seven research offices for large computer maintenance, computer applications systems, computer software, digital computing methods, control technologies, technical research and printed information, and it has a substantial "computer multifunction conference professional information processing system" key topic group established by the research offices. In addition, it has a processing workshop and a computer technology labor services company.

Since 1962, the institute has been engaged mainly in research concerning applications of computer technologies. From 1962 to 1976, it focused mainly on development of digital calculations for scientific computing and engineering design using the 103, 104, 108, 130, and other types of computers. After 1976, it took up research on computer applications, especially research on microcomputer applications, with a focus on applied systems and applications software, selection of key projects in national economic and national defense construction and attacks on key topics in computer applications systems, and it has carried out comprehensive development to form a perfect use environment.

Since 1978, it has made 25 scientific research achievements and 17 already have been extended. One topic won a National Science Conference award and eight received major S&T achievement awards from Sichuan Province. Examples include the "JCS-1 automatic internal monitoring and computer data processing system for large dams," the "JX-1" and "JX-2" computer real-time ballot processing systems and others at rather high levels, and they have played excellent roles in actual use.

Director: Wei Daozheng [7614 6670 2398]

Party secretary: [blank]

Academic Committee chairman: Wei Daozheng

Address: First Circle Intersection, South Renminlu, Chengdu

Telex: 0050

Telephone: 27941

Chengdu Scientific Instruments Factory

Preparations for construction of the Chengdu Scientific Instruments Factory began in March 1959, and it originally was called the Sichuan Branch Metal-working Factory. It was combined with the CAS Southwest Institute of Technical Physics in 1962 and changed again later. After establishment of the CAS Chengdu Branch in 1978, this factory was placed under the CAS and renamed the CAS Chengdu Scientific Instruments Factory. It now has 487 employees, 31.2 percent of them technical personnel. It has three workshops for comprehensive [work], electronic instruments, and optical instruments. The factory mainly serves scientific research and education and manufacturers various prototypes and products on a trial basis. In 1980 it was decided that the factory would develop and produce fairly advanced testing instruments for the CAS Earth Sciences Department and Biology Department, and that it would develop and produce fairly advanced electronics instruments for units within the academy.

Since its establishment, the factory has developed and produced more than 70 instruments in the fields of machinery, electronics, optics, etc., and the total number of prototypes and products exceeds 2,800 sets (pieces). Two products were named superior new products by the State Economic Commission, three received second place CAS S&T achievement awards, and three received fourth place Sichuan Province S&T achievement awards.

This factory participated in a joint attack on color television by five southwestern and northwestern provinces, and it produced large amounts of military telephone sets and other products. It developed small computers on a trial basis and was one of the first factories in China to produce a console style computer. It developed and produced China's first prototype transient waveform capacitor system. It has developed and produced stereo microscopes that are sold mainly in Europe, North America, and other developed nations where they have gained wide acceptance.

Director: [blank]

Party secretary: Du Junqing [6757 0193 0615]

Academic Committee chairman: Mu Jiaqin [4476 1367 2953]

Address: Huaxihouba, Chengdu

Telex: Chengdu 5478

Telephone: Chengdu 27941, extension 611

Chengdu Library

The Chengdu Library was established in 1958 and was known at the time as the CAS Sichuan Branch Library. It was combined with the Sichuan Province S&T Information Institute in 1971, and was separated from the Information Institute in 1978 to reestablish the CAS Chengdu Library.

The main task of this library is to provide printed S&T information to scientific research and production units of the CAS in the Chengdu region, and to use all its abilities to meet the S&T information needs of national economic development in Sichuan. The developmental direction of the Chengdu Library is to build up a systematic and comprehensive S&T library focused on the natural and technical sciences and with a full complement of retrieval tools and a strong ability to provide information services that will become the S&T information center for the CAS in the Chengdu region.

The Chengdu Library currently has 75 employees including 20 advanced and middle-level administrative personnel. Its holdings exceed 960,000 volumes.

The representative achievements include: extension of information on red nylon plastics throughout China and compilation of LIANGSHAN, GANZI, ABA ZHOU ZIYUAN KAOCHA SHILIAO XUANBIAN [SELECTED HISTORICAL MATERIALS ON RESOURCE SURVEYS OF LIANGSHAN, GARZE, AND ABA AUTONOMOUS PREFECTURES] and LIANGSHAN, GANZI, ABA ZHOU KUANGYE ZIYUAN HUIBIAN [COLLECTED INFORMATION ON MINERAL RESOURCE SURVEYS OF LIANGSHAN, GARZE, AND ABA AUTONOMOUS PREFECTURES], which have been important references for development of the "three autonomous prefecture" area.

Director: Hua Xianghan [5478 3276 5060]

Party secretary: Yi Qingtai [0151 3237 5060]

Academic Committee chairman: Hua Xianghan

Address: Huaxihouba, Chengdu

Telex: 0956

Telephone: 24282

Irradiation Preservation Technologies

Techniques that use irradiation to preserve the freshness of fruit developed by the Shanghai Institute of Nuclear Research are in wide use. They control diseases, reduce rotting, and control the post-maturation process, thereby lengthening shelf life. Irradiated apples can be stored for more than 9 months and irradiation can extend the freshness of strawberries for more than 40 days. Tests have shown that the irradiated fruit suffers no effects from the radiation and that no changes occur in nutritional components, microbes or trace elements.

Kunming Branch, Chinese Academy of Sciences

The Kunming Branch of the Chinese Academy of Sciences was established in 1958. It was combined with the Sichuan Branch in 1962 to form the CAS Southwest Branch. After 1967, it was set up in most research units in Yunnan and placed under Yunnan Province, the National Defense Science Commission and the Fifth Ministry of Machine Industry. After the various research institutes that had been transferred down to the province were recovered in 1978, the CAS Kunming Branch was established in March 1979 to act on behalf of the CAS in managing its research units located in Yunnan.

The research units under the jurisdiction of the Kunming Branch are: the Kunming Institute of Botany, the Kunming Institute of Zoology, the Yunnan Institute of Tropical Botany, the Yunnan Observatory, and an Ecology Office under its direct control, and it handles ideological and political work in the Yunnan Work Station of the Institute of High Energy Physics.

The Kunming Branch system has 1,455 employees (as of 1983), including 785 S&T personnel, 165 administrative personnel, and 505 workers. Of the S&T personnel, 41 are advanced researchers and 343 are middle-level personnel.

Director: Zhang Aoluo [1728 2407 5017]

Party secretary: Zhang Aoluo

Academic Committee chairman: Xian Chun [7639 2504]

Address: 20 Huguolu, Kunming

Telephone: 28505

Kunming Institute of Zoology

The Kunming Institute of Zoology was established in 1958. During its early period, the institute focused on studies of vertebrate taxonomical classification systems, but it now had developed into a multidisciplinary research organization with 279 employees including 9 personnel at the level of assistant researcher and above and 73 middle-level research and technical personnel, and it has 15 Master's level graduate students. It has five research offices for vertebrate taxonomical classification systems, cytology and genetics, entomology, resource zoochemistry and primate biology, and it also has a library information office and animal specimen hall.

The institute focuses on Yunnan as well as the southwest and is concerned mainly with protection and rational development and utilization of animal resources. It is involved mainly in research in the areas of vertebrate taxonomical classification systems, zoobiochemistry, primate biology, cytology and genetics, entomology, and other areas.

Five of the institute's scientific research achievements since its establishment have received National Science Commission awards, four received CAS major achievement awards, five received Yunnan Province S&T achievement awards, and one received a third place invention award. It has published 8 special works and more than 350 articles. In the area of vertebrate classification systems and taxonomy, it has carried out surveys in southwest and northwest Yunnan, especially in Xixuangbana and Gaoligang Shan. It has collected 50,000 vertebrate specimens and 400,000 insect specimens, and it has collected a large amount of scientific information and published several books and articles. In the areas of research and utilization of poisonous snakes and treatment of snakebite, it has purified eight types of toxic proteins and two types of enzymes, developed the biochemical reagent diesterase phosphate, the analgesic "ketongning" and the anticoagulant "(jianwen) pit viper venom fiber-removing enzyme," and used trypsin to treat snakebite. In the area of cytological research, the institute was the first to develop cell genetics methods for a new procedure to test antiradiation medicines. It has established a particularly Chinese cell collection, and it has done research on applications of cell genetics methods in environmental monitoring. It also has made achievements in experiments on domestic breeding and disease prevention in rhesus monkeys, laws of Yunnan armyworm flight migration, agricultural pest prevention, and other topics.

Director: Shi Liming [2457 4539 2494]

Party secretary: Li Nan [2621 0589]

Academic Committee chairman: Shi Liming

Address: Huahong Cave, West Suburbs, Kunming

Telex: 5363

Telephone: 82661

Kunming Institute of Botany

The Kunming Institute of Botany was established in 1958 on the basis of the CAS Institute of Botany Kunming Work Station. It was transferred downward to local administration in 1970 and renamed the Yunnan Institute of Botany. It was returned to the CAS in March 1978 and named the CAS Kunming Institute of Botany. It now has 354 employees including 186 S&T personnel (18 advanced researchers and 102 middle-level personnel). It has research offices for plant taxonomy and geography, plant chemistry, plant physiology and domestication (garden), as well as a wood and plant morphology and dissection group and an intermediate testing factory. It has more than 600,000 plant specimens and more than 70,000 bryophyte and fungus specimens.

The primary task of the institute since its founding has been on development, utilization, and protection of Yunnan's plant resources. It has made more than 260 S&T achievements since it was established, and it has written 305 articles and published more than 20 specialized works of varying length. The more prominent achievements include: ZHONGGUO ZHIWU QUXI DE REDAI QINYUAN [TROPICAL RELATIONSHIPS OF BOTANICAL CLASSIFICATION SYSTEMS IN CHINA], YUNNAN ZHIWU ZHI [ACTA BOTANICA YUNNANENSIS] (two volumes), research on plant steroid saponin resources, sexual propagation, and artificial synthesis of tianma [1131 7802 the tuber of *Gastrodia elata*, used as an anticonvulsant], research on qingyangcan [7230 7122 0639], a new antiepileptic, research on sulfur deficiency in paddy rice, the discovery of a new source, and technology for Kunming molting hormone--Cyanotis vaga (Lour.), etc.

Honorary director: Wu Zhengyi [0702 1767 6965]

Director: [blank]

Party secretary: [blank]

Address: Heilongtan, Kunming

Telex: 2784

Telephone: 24053

A New Pesticide--"Destructive Chrysanthemum Ester"

"Destructive chrysanthemum ester" is a new pesticide that has broad applications, is highly efficient and leaves low residuals. Because of its high efficiency, its nonpolluting, so it has been welcomed by the peasants. This new pesticide was developed by the CAS Chengdu Institute of Biology. The technology is simple, it consumes few raw materials and has high quality, and it is easy to produce industrially.

Yunnan Observatory

The Yunnan Observatory was established in 1972. Its predecessor was the CAS Purple Mountain Observatory Kunming Work Station. It is located at Fenghuang Shan in the eastern suburbs of Kunming at an elevation of 2,020 m. It is a comprehensive observatory that focuses on astrophysical research. It currently has six research offices for stellar physics, solar physics, astrodynamics, astrometry, radio astronomy, and new astronomical technologies, as well as a subsidiary factory, library and information office, electronic computer group, and other technical service systems. The observatory has 332 employees including 221 S&T personnel.

During the 1980's, the Yunnan Observatory has undertaken tasks of the CAS based on state astronomical plans. It is fully involved in perfecting observational and data processing conditions, improving research standards and scientific research qualities of S&T personnel, strengthening applied astronomical research and making full use of the low latitude and rather good observational conditions of the Yunnan Observatory so that it gradually plays a greater role in construction of the national economy and national defense as well as scientific research and other areas and in becoming an astronomical observation and research base area in southern China and continually intensifying research in solar physics, stellar physics, and other realms.

Its primary research achievements to date include observation and study of the precise structure of sunspots; forecasts of solar activity; research on collating the cycles of sunspot activity during ancient times in China; research on stellar evolution and high-energy physics; observational studies of satellite monitoring stations; precise measurements of world time, etc. Five achievements have received Science Commission awards, 9 have received CAS major achievement awards, and 12 have received Yunnan Provincial S&T achievement awards.

Director: Chen Biao [7115 1753]

Party secretary: Wu Minran [0702 2404 3544]

Academic Committee chairman: Chen Biao

Address: Fenghuang Shan, Eastern Suburbs, Kunming, Yunnan

Telex: Kunming 1131

Telephone: 22034, 22036

Yunnan Institute of Tropical Botany

The predecessor of the Yunnan Institute of Tropical Botany was the Xishuangbana Tropical Botanical Gardens of the Kunming Branch of the CAS Institute of Botany. It was established in Xishuangbana in 1959 and converted to a research institute in 1970. The institute has 13,500 mu of land and already has set up more than 3,000 mu of tropical botanical gardens as well as seven research offices in the areas of plant taxonomy, plant chemistry, plant physiology, plant introduction and domestication, economic plant cultivation, experimental plant communities and information, as well as an intermediate testing workshop for plant products.

This institute focuses on research concerning rational development, utilization and protection of tropical plant resources. It currently is engaged mainly in developing research on zoning systems for tropical plants and plant resources in southern Yunnan, research on tropical plant communities and experimental plant communities, research on tropical plant introduction and protection of endangered plants, cultivation of tropical economic plants, etc.

The institute has introduced and cultivated more than 2,000 varieties of tropical and subtropical plants from China and abroad and has made more than 100 research achievements since its establishment. The more important ones include: research on artificial plant communities for rubber and tea; research on exploitation of resources, introduction, domestication and development of plants used for important southern medicines and other medicines, including *Amomum villosum* Lour., *Daemonorops draco* Bl., (bibo), *Homalomena occulta* (Lour.) Schott, *Rauwolfia verticillata* (Lour.) Baill., (jialan), *Maytenus lookeri*, etc.; research on exploration, introduction and afforestation of tropical fast-growing and valuable timber tree resources, including (tuanhua), Yunnan (shi) Catalpa, (wantgian) trees, (heihuangtan), teak, balsa, etc.; research on exploration, introduction, domestication and development of other tropical economic plants like large-fruited *hodgsonia*, (fengchuinan), (guajiao) beans, Yunnan camphor, (yilanxiang), pomelo, mango, (meilishan) hyacinth beans, etc. Moreover, definite achievements have been made in research on laws and methods of tropical plant introduction and domestication, rational routes and methods for developing mountainous areas in the tropics, and other areas. In addition, it has published the XISHUANGBANA ZHIWU MINGLU [PLANTS OF XISHUANGBANA], REDAI ZHIWU YANJIU LUNWEN BAOGAO JI [COLLECTION OF ARTICLES AND REPORTS ON TROPICAL PLANT RESEARCH], XISHUANGBANA DAIYAO ZHI [XISHUANGBANA DAI MEDICINES], XISHUANGBANA REDAI YESHENG HUAPEN [TROPICAL WILD PLANTS AND FLOWERS OF XISHUANGBANA], and other works.

Director: Pei Shengji [5952 4141 1015]

Party secretary: Lu Shao [0712 7300]

Academic Committee chairman: Pei Shengji

Address: Xiaomenglun, Jinghong County, Xishuangbana Dai Autonomous Prefecture, Yunnan Province

Telex: Jinghong County, Yunnan Province 0954

Telephone: Xishuangbana Autonomous Prefecture 905

Guangzhou Branch, Chinese Academy of Sciences

The Guangzhou Branch is an agency of the CAS that manages seven research institutes (stations) in Guangzhou: the Guangzhou Institute of Chemistry, the South China Sea Institute of Oceanology, the Guangzhou Institute of New Geological Techniques, the Guangzhou Institute of Electronic Technology, the Guangzhou Institute of Energy Resources, the South China Institute of Botany, and the Guangzhou Satellite Observation Station.

The Guangzhou Branch currently has 2,529 employees including 2,058 S&T personnel (62 advanced and 666 middle-level research and technical personnel). The organs in the branch now have 75 people.

Director: Wu Wen [0702 2429]

Party secretary: Yu Kan [0060 0170]

Advisor: Liang Jia [2733 0857]

Address: 100 Xianliezhonglu, Guangzhou

Telex: 0863

Telephone: 75600

South China Sea Institute of Oceanology

The South China Sea Institute of Oceanology was established at the beginning of 1959 and was transferred downward as a system to the Guangdong Province Institute of Oceanology in 1970. It was returned to the CAS and given its present name in 1973.

The institute now has 707 employees including 444 S&T personnel (19 advanced researchers and 205 middle-level researchers). It has two survey vessels, the 3,300-ton "Shiyan [Experiment] 3" engaged mainly in comprehensive marine surveys and the 1,100-ton "Shiyan 2," engaged mainly in geophysical prospecting.

The institute's main orientations are oceanic survey research in the South China Sea and adjacent waters and research on development and utilization of marine resources, especially petroleum and natural gas, as well as marine biological resources and power resources. The range of research includes the characteristics of marine environments, geological evolution, ecology, experimental ecology, coastal and river mouth processes, ocean-atmosphere interactions, applications of new technologies, etc. Since its establishment, the institute has carried out comprehensive regional survey research in the South China Sea and adjacent waters, especially concerning the continental shelf in the northern part of the South China Sea and the terrain of the Zhongsha [Paracel] Islands and adjacent waters, geophysics, geological structures, sea-bottom sedimentation, hydroclimatology, physiochemical factors in seawater, marine ecology, the geology and geomorphology of coral reefs and islands, the biological conditions and ecological characteristics of islands and reefs, and other types of multidisciplinary survey research, and it has accumulated a large amount of data and samples. Substantial progress also has been made in research on river mouth and coastline processes, pollution conditions and environmental quality of offshore waters, the biology of pearl oysters and artificial cultivation of them and pearls, the physiology and ecology of laver [*Porphyra* spp.] and (jiangli) and the prevention of pollution damage to organisms.

The institute has made 215 S&T achievements, including National Science Commission awards for comprehensive marine survey research of the Zhongxi and Zhongsha [Paracel] Islands and adjacent waters, research on the engineering hydrology of harbors and silt migration in south China, research on artificial cultivation and breeding of pearls and permanent marine tidal flow forecast charts for China's offshore areas. It also has received CAS major achievement awards for Quaternary geological survey research on the southern Chinese coast, varietal cultivation of Guangdong laver, and others.

The institute also publishes the scholarly journals NANHAI HAIYANG KEXUE JIKAN [COLLECTED ARTICLES ON MARINE SCIENCES IN THE SOUTH CHINA SEA] and REDAI HAIYANG [TROPICAL SEAS] (quarterlies).

Director: Xu Gongzhao [1776 1872 2507]

Party secretary: [blank]

Academic Committee chairman: Xu Gongzhao

Address: 164 West Xinganglu, Guangzhou, Guangdong Province

Telex: 0380

Telephone: 47336

South China Institute of Botany

The predecessor of the South China Institute of Botany was the Zhongshan University Institute of Agricultural and Forestry Botany, established in 1928. It was placed under the CAS in 1954 and renamed the South China Institute of Botany. Later, it was transferred downward to Guangdong Province and then returned to the CAS in 1978. It now has 556 employees including 324 S&T personnel (24 advanced level and 171 middle level).

It has 8 scientific research offices for plant taxonomy, plant ecology, plant physiochemistry, plant resources (plant chemistry), plant morphology, plant genetics, plant introduction, and domestication and horticulture. It has an herbarium with 600,000 samples, 2 plant gardens (the South China Plant Garden, covering 4,500 mu and having a total of more than 4,000 introduced plants, and the Dinghu Shan Tree Garden with a natural protection area of 1,100 hectares and more than 2,000 plant varieties), 2 permanent research stations (the Dinghu Shan Southern Subtropics Forest Ecology System Fixed Research Station and the Dianbai [County] Xiaoliang Tropical Artificial Forest System Fixed Research Station).

Before liberation, the institute was engaged mainly in collecting plant specimens and carrying out research on plant taxonomy. After being placed under the CAS, it developed into a multidisciplinary comprehensive botanical research institute whose research and main tasks were focused on development and utilization of tropical and subtropical plant resources, and on their introduction, domestication, and protection.

At present, besides its continuing role as editor of ZHONGGUO ZHIWU ZHI [ACTA BOTANICA SINICA] and GUANGDONG ZHIWU ZHI [BOTANY OF GUANGDONG], the institute's research is focused on topics that include tropical and subtropical forest ecosystems, the physiology of cold resistance in plants that prefer warm climates and varietal quality preservation, cell engineering, development, and utilization of medicinal and aromatic plant resources, the physiology and control of southern fruits and seed post-maturity, the introduction and domestication of tropical and subtropical plants, genetic variation and techniques for breeding new varieties. Since 1954, the institute has published more than 30 special works including NANHAI ZHIWU ZHI [BOTANY OF THE SOUTH CHINA SEA], GUANGZHOU ZHIWU ZHI [BOTANY OF GUANGZHOU], GUANGDONG ZHIBEI [THE VEGETATION OF GUANGDONG PROVINCE], ZHONGGUO ZHONGZI ZHIWU KESHU CIDIAN [DICTIONARY OF CHINESE SEED PLANT FAMILIES AND GENERA], REDAI, YAREDAI BEIZI ZHIWU HUAFEN XINGTAI [MORPHOLOGY OF TROPICAL AND SUBTROPICAL ANGIOSPERM POLLEN], ZHONGGUO ZHIWU ZHI, and others. It has made more than 200 important achievements, the more prominent ones being a "three system" arrangement for hybrid improved paddy rice, rubber transplantation to the north, a volume of ZHONGGUO ZHIWU ZHI concerning gymnosperms, selection and utilization of plants resistant to atmospheric pollution, the reasons for agallock eaglewood and aroma formation and artificial aroma formation, high-yield cultivation of *Amomum villosum*, rapid breeding of horticultural plants, 1.7-m high-speed cold oil pressing, synthesis of musk ketone from the oil of *Mallotus apelta* (Lour.) Muell.-Arg., the anticancer plant double-combined three-pointed Chinese fir, and others.

Honorary director: Chen Fenghuai [7115 1409 2037]

Director: Guo Junyan [6753 0193 1750]

Party secretary: Hong Guanghua [3163 0324 5478]

Academic Committee chairman: Huang Chengjiu [7806 2052 1432]

Address: Wushan, Guangzhou

Telex: 5451

Telephone: 76434 (central switchboard)

Guangzhou Institute of Chemistry

The Guangzhou Institute of Chemistry was established in 1958 under the name of the Guangzhou Institute of Applied Chemistry. Later, it was transferred down to Guangdong Province and returned to the CAS in 1978, when it was renamed the CAS Guangzhou Institute of Chemistry. It now has 428 employees including 297 S&T personnel (9 advanced researchers and 121 middle-level researchers). It has five research centers for cellulose, polymers (grouting materials, adhesives, and other synthetic materials), natural organic chemistry (terpenoid chemistry and the organic chemistry of perfumes and marine products), analytical testing, and printed information.

The institute was involved mainly in research on cellulose modification, rare metals, and silicates during its early days. Later, cellulose chemistry, polymer chemistry grouting materials, and perfumes became the main research orientations. A preliminary decision was made in 1979 to make natural organic chemistry (cellulose chemistry, marine natural organic chemistry, and terpenoid chemistry), polymer chemistry and physics (polymer chemistry grouting materials, polymer adhesives, and high polymer aggregate state structures) the main focus of research. The long-term directions of scientific development were decided upon in December 1982: 1) natural and synthetic polymer materials and science; and 2) the organic chemistry of natural products.

The institute has had 82 major scientific research achievements since it was founded. These include four new topics on technologies for fiber modification in *Boehmeria nivea* (L.), anaerobic sealing adhesives, the oilwell water sealant FHPAM, and the use of *Eucalyptus citriodora* oil to synthesize musk oxyphenol that have received state invention awards. Other important achievements include high polymer grouting materials, several types of normal temperature fast-setting adhesives, strong fibers from sugar cane bagasse, high-temperature modulus adhesive fibers, toluene disproportionation and meta-tritoluene isomerization catalysts, polyacrylonitrile fiber formation, and the weaving of mosquito nets, chemical spermicides, one-step synthesis of borneol, etc.

Director: Liu Zhujin [0491 6999 2516]

Party secretary: Liu Baixiu [0491 4102 4423]

Academic Committee chairman: Liu Zhujin

Address: Wushan, Guangzhou

Telex: 0871

Telephone: 77483; 77484

Guangzhou Institute of Electronic Technology

The predecessor of the Guangzhou Institute of Electronic Technology was Guangdong Province Institute 701, which was founded in 1970. It was placed under the CAS and given its present name in 1978. It now has 401 employees, including 291 S&T personnel (9 advanced researchers and 185 middle-level researchers). Before 1982, the institute was engaged mainly in research on space remote sensing technologies. It now is involved primarily in theoretical and technical research on information processing and information transmission and expanding its utilization in the national economy. Fields in which research work has developed so far include microcomputer applications, software development and Chinese character information processing; information transmission and infrared communications technologies; data collection, remote sensing, remote control and automatic monitoring and control systems; self-adapting signal processing and numerical signal processing; optical-digital image processing and discrimination; laser technologies; optical crystals and ultrahard materials; and new surface processing techniques.

The institute has made 71 major scientific research achievements since it was founded. Examples include FMB Chinese character base information compression and recovery techniques, Chinese word processors that automatically convert pinyin into Chinese characters, infrared simultaneous translation systems, satellite silicon solar cell modelers, high pressure scientific balloon beacons and direction monitors, closed nitrogen ion lasers, lithium fluoride optical crystals, KRS-5 infrared optical crystals, automatic monitoring systems for scientific satellites, terminal equipment for scientific satellite ground tracking and receiving stations, laser measurement of movement in tall structures, wheeled nondestructive holographic laser testers, RG-1500V ultrahigh pressure equipment, infrared photoelectronic controllers, 10-cm semiconductor radar, chemical etching techniques for the surfaces of aluminum, marble, stainless steel, and steel metals, etc.

Director: Deng Naijiong [6772 0035 3518]

Party secretary: [blank]

Academic Committee chairman: Pan Hua Jiang [3382 5478 3068]

Address: 100 Xianliezhonglu, Guangzhou

Telex: 0788

Telephone: 75947

Guangzhou Institute of Energy Resources

The predecessor of the Guangzhou Institute of Energy Resources was the Guangdong Province Institute of Geothermal Energy, founded in 1973. It was placed under the CAS in 1978 and named the CAS Guangzhou Institute of Energy Resources. It currently has 183 employees including 130 S&T personnel (7 advanced researchers and 72 middle-level researchers).

During its early days, the institute was engaged mainly in research on bases for application and applied technologies of new energy resources in areas like biomass energy, geothermal energy, solar energy, oceanic energy, etc. In 1982, it added research concerning comprehensive utilization of new energy resources in rural areas and energy-conserving technologies related to industrial waste heat and oriented mainly toward providing fuel, motive power, and electricity and improving the efficiency of energy conversion and lowering cost.

The institute has made 13 major scientific research achievements since its founding, including four projects that received second place or better CAS scientific research achievement awards. These included intermediate testing of an intermediate dielectric dual-flow system to generate power using geothermal energy in Fengshun County, Guangdong Province, the Junqiao methane power station in Foshan County, Guangdong Province, and experiments using anaerobic filter processing to strain liquor dregs, and extract methane.

Director: Wu Zhijian [0702 3112 1017]

Party secretary: Yang Baoshan [2799 1405 1472]

Academic Committee chairman: Wu Wen [0702 2429]

Address: 81 Xianliezhonglu, Guangzhou

Telex: 0508

Telephone: 78642

Guangzhou Institute of New Geological Technology

Preparations for the Guangzhou Institute of New Geological Technology began in 1977. Research offices for remote sensing applications, seismic holography, image processing, electromagnetism, and printed information were established in 1979. It undertook applied research in remote sensing technologies, seismology, and other areas and developed instruments. It now has 120 employees including 42 S&T personnel (1 advanced researcher and 24 middle-level personnel).

The institute was changed to a development-oriented one in 1984 and is engaged mainly in applied development projects for new technologies in the earth sciences and other fields. It has established the "Guangzhou Geological Development Co." to take responsibility for the development of various types of medium and small special-purpose geological testing instruments in China, development of various types of specialized software used in geological and environmental digital testers, digital processing and equipment management, providing advice, discussion and designs for development of resources, water sources, energy resources, mineral materials used in industry, construction materials, etc., in China, bearing responsibility for comprehensive and specialized aerial remote sensing tasks inside China and abroad, providing surface condition survey and detection services, development of aerospace and aerial remote sensing instruments, and in processing and interpretation of remote sensing images.

Major achievements at the institute since its founding include H-10 geophysical spectral radiation agents, white light false-color real-time display equipment, the regional distribution of lithofacies structures at the Ertan Hydropower Station on the Yalong Jiang, analysis and analytical application of the distributional characteristics of geological structures, and the characteristics of geophysical spectra, and application of vertical profiling seismology to explore geothermal resources in granitic regions.

Director: [blank]

Party secretary: [blank]

Academic Committee chairman: Li Zhonglin [2621 6988 7207]

Address: Wushan, Guangzhou

Telex: 0936

Telephone: 75932

Guangzhou Satellite Observation Station

The Guangzhou Satellite Observation Station was established in 1958 and is the lowest latitude satellite observation station in China. It has installed large-scale optical and radio observation equipment, and it has orbital observation capability for placing satellites into orbit and conventional tracking as well as the capability to monitor China's long-wave time signals. It currently has 80 employees including 57 S&T personnel (4 assistant researchers and 7 engineers). At present, the institute is involved mainly in research on observation of man-made celestial bodies, standard time and standard frequency monitoring, orbital theories of earth satellites and the laws of electric wave transmission, and it also has developed some electronic instruments.

Since the observatory was founded, it has worked with other observatories to complete conventional observation tasks for over 10 Chinese and foreign satellites and rockets that have provided a foundation for understanding satellite operation and studying the laws of changes in satellite orbits. It has carried out barrier observations of newly-launched Chinese satellites as well as Chinese and foreign man-made celestial bodies that eventually will fall to earth, which has provided a foundation for determination of preliminary satellite orbits and time of fall. During joint observations using geometric methods to determine the coordinates of the center of the Xisha (Paracel) Islands, it worked together with the Purple Mountain Observatory, the Yunnan Observatory and other units to carry out precise observations and determine the location of Yongxing Island in the Xisha Islands within plus-or-minus 6.9 m, reaching international levels. It has won awards from the National Science Society and the CAS. It began participating in 1978 in joint total satellite observations to determine earth core coordinates and provided a large amount of highly precise observational data. It also has monitored high-powered standard time and frequency signals broadcast for the first time in China (BPL signals) and gathered a large amount of data.

Director: Xu Mao [1776 4243]

Party secretary: Huang Yongjin [7806 3057 0193]

Academic Committee chairman: Xu Mao

Address: Wushan, Guangzhou

Telex: 4117

Telephone: 78324 78325

Changchun Branch, Chinese Academy of Sciences

The Changchun Branch of the Chinese Academy of Sciences is an agency of the CAS that manages five CAS research institutes (and stations) in Changchun: the Changchun Institute of Optics and Fine Mechanics, the Changchun Institute of Applied Chemistry, the Changchun Institute of Physics, the Changchun Institute of Geography, and the Changchun Satellite Observatory.

The Changchun Branch has a total of 5,765 employees including 4,289 S&T personnel (158 advanced research and technical personnel and 1,260 middle-level personnel). The organs of the branch have 81 employees.

Director: Wu Yue [0702 6390]

Party secretary: Dan Fanqi [0830 5672 0967]

Academic Committee chairman: He Ke [0149 0344]

Address: 134 Stalin Avenue, Changchun

Telephone: 25061

Changchun Institute of Optics and Fine Mechanics

The Changchun Institute of Optics and Fine Mechanics was formed in 1960 by the combination of the former CAS Institute of Optics and Fine Mechanics and the Institute of Mechanics.

The institute is engaged in research work in the areas of applied optics, optical materials, fine mechanics, and optical instruments. It has laboratories for optical design and inspection, thin membrane optics, optical information processing, photoelectric technologies, spectral and photometric technologies, laser components, grating and fine engraving, optical glass and crystals, mechanical drives, mechanical lubrication, mechanical materials and optical engineering, as well as an instrument manufacturing plant.

Shortly after the nation was founded, the institute played a vanguard role in the establishment of an optics industry in China in the areas of optical glass-making, optical lens design, thin membrane techniques, microscopes, measurement instruments, precision measurement instruments, spectrometers, and other areas. Achievements in the field of mechanics have been made in the areas of stress analysis, pressurized processing metals, casting of ferrous metals, and other areas. China's first electron microscope and first laser were successfully developed by this institute in 1958 and 1961, respectively. Areas of obvious progress in recent years include zoom lens systems for color movie cameras, grating and engraving technologies, precision circular engraving and angular encoders, precision gear and drive systems, various types of multilayer optical membrane systems, tunable lasers and laser applications, some special color-diffusing optical glass and infrared admitting glass, optical remote sensing and comprehensive aperture correlation processing, soft X-ray optics systems, prospecting instruments, solar radiation modeling equipment, etc.

Honorary director: Wang Daheng [3769 1129 3801]

Director: Tang Jiuhua [0781 0046 5478]

Party secretary: Cai Rentang [5591 0088 1016]

Academic Committee chairman: Wang Daheng

Address: 112 Stalin Avenue, Changchun

Telex: 6109

Telephone: 24692; 24697

Changchun Institute of Applied Chemistry

The predecessor of the Changchun Institute of Applied Chemistry was the Northeast Institute of Science, founded in 1948 on the basis of the remnants of the Continental Institute of Science established by the puppet Manchukuo regime. It was placed under the CAS in 1952 and renamed the Changchun Multipurpose Institute. In June 1954, the chemistry component of the Changchun Multipurpose Institute was combined with the CAS Shanghai Institute of Physical Chemistry and formally named the CAS Changchun Institute of Applied Chemistry.

It now has 1,391 employees including 679 S&T personnel (12 researchers, 72 assistant researchers, 4 advanced engineers, and 508 middle-level S&T personnel). It has 28 research offices including electrochemistry, polymer membranes, polymer catalysts, high-yield element catalysis, rare earth chemistry, and other areas. The institute has five primary research orientations:

- [1] polymer chemistry and physics, mainly involving research on dialkene rare earths and catalytic stereospecific polymerization of other transitional metals, new types of special polymers, functional polymers, multiphase polymers, polymer radiation chemistry, chain structures and aggregate state structures of water-soluble high polymers and polymer mechanics, heat, solution, deformation performance, processing of polymer materials, and other topics;
- [2] physical chemistry, mainly involving research in areas like catalysis, electrochemistry, laser chemistry, semiconductor chemistry and physics, metallic corrosion and prevention;
- [3] inorganic chemistry, mainly involving research on the solid chemistry of rare earth elements, chemistry of complex, separation chemistry, fused salt chemistry, and the structural chemistry of rare earth ions and compounds;
- [4] analytical chemistry, mainly involving atomic radiation and absorption spectra analysis, spark source mass spectrographic analysis, X-ray fluorescent analysis, electrochemical analysis, spectrophotometric analysis, organic trace analysis and structural analysis, and analysis in the areas of rare earths, environmental protection, and traces;
- [5] structural chemistry, mainly involving the use of various methods of modern physics like spectrum, vibration spectrum, quaternary diffraction, etc., to study the structures of high polymers, coordination compounds, metallic organic compounds, etc.

The institute has made more than 700 research achievements since its founding, including more than 200 rather important ones. It has been prominent in the fields of synthetic rubber, rare earth chemistry, special polymer materials, multiphase polymers, catalysis, electrochemistry, structural chemistry, and analytical chemistry. It has successfully studied a series of synthetic rubber products, including nickel maleate rubber which now is being produced and is the first general-purpose rubber that China successfully researched on its own. The institute has successfully developed butylhydroxide, butylcarboxyl, and butadiene-carboxyl acrylonitrile, and other solid rocket fuel adhesives and propulsives, and other special types of polymer materials. It has systematically developed research on extraction, separation, and analysis of 15 types of rare earth elements and provided China with a new extraction and separation process for rare earth minerals. The institute has successfully developed a series of new rare earth catalysts and rare earth materials and

made a contribution to the development of China's rare earth industry. It has studied and recommended an acid bath anticorrosive boiler cleaning method and other important energy-saving technologies. It has established a variety of trace analysis methods and provided analytical methods and a great deal of data concerning inorganic and organic water pollutants in the No 2 Songhua Jiang. The institute has developed structural analysis methods and produced on a trial basis and imitated new spectral, polarographic, spectroscopic, and other types of instruments. Definite accomplishments also have been made in polymer chemistry and physics, basic qualities of rare earths, electrochemistry, metallic corrosion, structural chemistry, and other basic and theoretical research.

Director: Wang Fusong [3769 0154 2646]

Party secretary: Wang Zhang [3769 4545]

Address: 109 Stalin Avenue, Changchun

Telex: 6282

Telephone: 27005

Changchun Institute of Physics

The predecessor of the Changchun Institute of Physics was the Northeast Institute of Physics established in 1958. In 1965 the Solid Luminance Office of the CAS Institute of Physics was moved to Changchun and combined with the Northeast Institute of Physics to establish a specialized research institute focused on luminescence and its applications. It now has 23 S&T personnel with high-level positions and 256 middle-level personnel. It is in the process of organizing three experimental regions: the physics experiment region, focused on a spectral laboratory, a materials experiment region focused on thin-membrane structural materials, and an instrument technology region working for the integration of luminescent and electricity-generating components.

Currently, the institute is engaged mainly in research on spectral and transient process high excitation density and is searching for ways to improve and create luminescent material and components, and it is intensifying research on basic questions in solid physics. It is exploring broad stopband semiconductor luminescent materials and rare earth luminescent materials, and it is studying the relationship between the optical and electrical qualities of materials and their formation and structure as well as basic questions in the growth process of artificial materials and using various technical measures to obtain thin-layer structural materials. It is developing research on illumination and special types of light sources, display and imaging technologies and photoelectronic systems including individual components and integrated technologies.

Since its establishment, the institute has designed and developed photoelectronic dual-control memory switching tubes, which have made it possible to find real programs for electroluminescent screen memory capabilities. It has developed various luminescent materials used in color televisions, high-luminescence projection televisions and picture stabilizers. In addition, it has developed various forms of powder, membrane, and uniaxial electroluminescent materials and photoluminescent materials that have filled in blanks in China, and some of them have reached or approached international levels. These materials have been used to make enameled electroluminescent screens, luminescent diodes, electroluminescent matrix screens, and electroluminescent membrane screens (like large area matrix displays, flow process modeling displays, digital displays, and Chinese character displays), as well as ultraviolet and visible illumination lights, and other things that now are being used for national defense and civilian purposes.

Director: Xu Xurong [1776 0650 8833]

Party secretary: Zheng Zhilong [6774 4249 7893]

Academic Committee chairman: Xu Xurong

Address: 1 Yan'an Highway, Xinmin Guangchang, Changchun

Telex: 5431

Telephone: 52215

Changchun Institute of Geography

The Changchun Institute of Geography was established in September 1958. Its original name was the CAS Jilin Branch Institute of Geography under dual leadership of the CAS and Jilin Province. The Jilin Branch of the CAS was disbanded in 1961 and some personnel formerly in the Institute of Geology were combined with this institute and it was renamed the Jilin Institute of Geology and Geography. It underwent several changes later and was returned to the CAS in June 1978 and named the CAS Changchun Institute of Geography.

The institute now has 269 employees including 144 S&T personnel. It has five research offices for marshes, economic geography, chemical geography, remote sensing and cartography, as well as a printed information office, a central laboratory, a map printing plant, and other auxiliary organs. It is involved mainly in research on the development and utilization of marsh resources across China and on research concerning geographical topics in northeast China.

The institute has made more than 100 scientific research achievements since it was founded, including more than 30 major achievements like research on the compilation of an aerial atlas of China's main rivers, a comprehensive survey of the marsh and wasteland resources in the Sanjiang Plain, research on mercury pollution and methods of controlling it on the No 2 Songhua Jiang, survey research on peat resources in Jilin Province, experimental research on well drainage and well irrigation to transform marshes in the Sanjiang Plain, research on the geomorphology of northeast China, etc.

Director: Liu Zheming [0491 0772 2494]

Acting party secretary: Liu Zheming

Address: 10 Gongnong Dalu, Changchun

Telex: 3810

Telephone: 53052

The Genetics Survey of Chinese Human Colonies

The CAS Institute of Genetics has surveyed more than 10 nationalities for the rate and category of marriages between close relatives, onset of menstruation, rate of red-green colorblindness, palm lines and fingerprints, and rate of inability to taste benzothiourea. In addition, a blood type survey and physical measurements were carried out on the Elunchun and Ewenke nationalities, including the first report in China concerning the rate of marriage between close relatives and research on multiple genetic indices for clans. This is of major significance in the popularization of higher quality births to strengthen the future of the Chinese nation.

Changchun Satellite Observatory

The Changchun Satellite Observatory was established in 1958. It currently has 37 S&T personnel including 12 S&T personnel at the engineer and research assistant levels and above. The observatory is engaged mainly in tracking and observing man-made earth satellites, making precise orbital determinations, developing research in geodesy, atmospheric density, satellite movement theory, and geomechanics.

Since its establishment, the observatory has been rather successful in tracking and observing Soviet and Chinese satellites. In addition, it has also developed orbital research and 60 m laser distance measuring systems. Since 1980, it has published treatises like "A New Method for Calculating Satellite Perturbation" using an implicant-type differential equation small parameter solution method that have been acknowledged by international colleagues.

Director: Li Yulin [2621 3768 2651]

Party secretary: Cui Xixing [1508 3556 2502]

Academic Committee chairman: Li Yulin

Address: Jingyuetan, Changchun

Telex: 2421

Telephone: 42801

Heilongjiang Institute of Agricultural Modernization

The Heilongjiang Institute of Agricultural Modernization was established in 1978. It has five research offices for comprehensive multidisciplinary activities, cropping, breeding, energy resources, and processing and horticulture, and a testing laboratory, as well as the Hailun Laboratory. It has 134 formal employees at the present time, including 91 S&T personnel (6 advanced researchers and 38 middle-level researchers).

The institute is located in Hailun County and is oriented toward northeast China. It has developed research on the different levels and layers of agricultural systems and explores routes to Chinese-style agricultural modernization.

The more representative scientific research achievements of the institute since its establishment include: a comprehensive survey of natural resources in Hailun County, research concerning leaf mottling in corn due to a shortage of zinc in carbonate meadow soil regions of Hailun County, research on optimized structures for agriculture, forestry, and animal husbandry in Baifa Village, Lianfa Township, Hailun County, research on the structure and function of agricultural ecosystems in Laozhou Commune, experimental research on the use of nitrogen-fixing blue-green algae to promote material growth in upland spring wheat in northern China (in cooperation with aquatics), research on comprehensive design and modeling systems for social, economic, ecological, and technical systems in Hailun County, etc.

Director: [blank]

Party secretary: [blank]

Address: Hapinglu, Nangang District, Harbin

Telex: 6210

Telephone: 63227

Shenyang Branch, Chinese Academy of Sciences

The Shenyang Branch is an agency of the CAS that manages seven CAS research institutes (and factories) in the Liaoning region: the Dalian Institute of Chemical Physics, the Institute of Forestry and Soil Sciences, the Institute of Metals, the Shenyang Institute of Computing Technology, the Shenyang Institute of Automation, the Metal Corrosion and Protection Institute, and the Shenyang Scientific Instruments Factory.

The Shenyang Branch currently has 5,109 employees including 3,927 S&T personnel (166 advanced research and technical personnel and 1,530 middle-level personnel). There are 113 employees working in organs of the branch and units under its jurisdiction.

Director: Guo Kexin [6753 0668 0207]

Party secretary: Luo Jixun [7428 4949 8113]

Advisor: Zheng Chongda [6774 1504 6671]

Address: Sanhao Street, Heping District, Shenyang

Telephone: 482758

Dalian Institute of Chemistry and Physics

The Dalian Institute of Chemistry and Physics was established in 1949. It has been called the Dalian University Institute of Science, the Northeast Institute of Science, Dalian Branch, and the CAS Institute of Industrial Chemistry Petroleum Institute. It acquired its present name in 1962.

The institute now has 1,348 employees including 807 S&T personnel (13 researchers, 41 assistant researchers, 3 advanced engineers, and 411 research assistants and engineers). It has 16 research offices for analytical chemistry, complex catalysis, chemical reaction engineering, chromatography, catalytic chemistry, and other areas as well as an instruments factory.

The institute is engaged mainly in modern organic analytical chemistry and engineering chemistry focused on catalysis and catalytic bases, chemical lasers, microreaction mechanics, and chromatography, and it also has developed laser chemistry.

The institute has had 297 scientific research achievements since its founding. It has done rather well in the areas of catalysis, chromatography and chemical industry precision ions. The more important achievements include: hydrogen flame assessors, capillary color chromatographs, attitude control catalysts for use in space, zeolite molecular sieves, synthetic liquid fuels from water and coal gas, various high efficiency catalysts used in reforming, hydrogenation, dehydrogenation, cracking, polymerization, isomerization, and other activities, multipipe tower ionizing for concentrating heavy water, a catalyst for a new process to purify raw material gas for synthetic ammonia, equipment for making and testing ultra-pure gas, chromatographic analysis methods for fluorine-containing corrosive gases and process control equipment, high-efficiency deoxidizers, desulfurization methods for use on the smokestacks of thermal-fired power plants, space fuel batteries, intersecting molecular beam experiment equipment, etc.

Director: Lou Nanquan [2869 0589 3123]

Party secretary: Qiu Zongtao [5941 1350 3447]

Academic Committee chairman: Lou Nanquan

Address: 161 Zhongshanlu, Dalian

Telex: 4430

Telephone: 31845

Institute of Metals

Preparations for the Institute of Metals began in 1951, and it was formally established in 1953. It was at one time under the jurisdiction of the National Defense Science Commission and the Ministry of Metallurgical Industry. It was placed under the CAS in 1978. It now has 1,157 employees including 583 S&T personnel (3 academic committee members, 52 advanced S&T personnel and 422 middle-level personnel).

During the 1950's, the Institute of Metals mainly served China's iron and steel industry. Its focus shifted in the late 1950's to the development of new materials, new technologies, and new testing methods and it made a contribution to the establishment of infusible metals, titanium alloys, high-temperature alloys, special steels, graphite, and other materials systems and to effective resource utilization. At the end of the 1970's, it was decided that the main scholarly orientation would be materials science and engineering and that the primary research topics would be microstructures of materials and their relationship to various performance as well as alloy phase diagrams, phase transitions, qualities of liquid metals, etc. In addition, it developed research on structural materials and components under special conditions, new technologies, compound materials, noncrystalline and microcrystalline materials, high-temperature structural ceramics and other types of new materials, special types of nondestructive testing techniques and technologies used for measurement of physical and mechanical qualities under extreme conditions, and other topics.

The institute has made 271 scientific research achievements since its founding including 21 projects that have received national awards and second place or higher awards from the CAS. In the 1950's, it developed blast furnace clay bricks, substituted aluminum magnesium bricks for open hearth furnace chromium magnesium bricks and established techniques for analyzing the gases in steel and contaminating ions in nonmetals and extended them throughout China. It received a National Science Award in 1956 for research on consumption in metals and hydrogen in steel.

Beginning in the late 1950's, the institute provided key materials and technologies for the development of China's atomic power, guided missile, space, aviation, navigation, and conventional weapons industries, filling in some of China's blank spaces and sometimes reaching international levels. In the area of civilian materials and technologies, it developed various types of surface coatings, overlaying materials used in water turbines, low-temperature steel using no nickel or chromium, nickelless stainless steel resistant to urea corrosion, sunken hole anvils used in mineral extraction, application of rare earths in steel, etc. In addition, it set up and developed China's first new technologies related to materials manufacture and testing like high-pressure electron beam welding, sonic radiation, and other technologies. It also made new discoveries in research work concerning the microstructure of materials, atomic shape, surface structures, dislocation configurations, and other areas.

Director: Shi Changxu [1597 2490 4872] (concurrent)

Party secretary: Xu Zengji [1776 2582 1015]

Academic Committee chairman: Shi Changxu

Address: No 6, Section 2, Wenhua¹u, Shenyang

Telex: 4430

Telephone: 483531

Institute of Forestry and Soil Sciences

The Institute of Forestry and Soil Sciences was established in 1954 and is a comprehensive biological--earth science research institute based on forestry, soils, microbiology, botany, and other disciplines. It was transferred downward to Liaoning Province in 1970 and was recovered by the CAS in 1978.

The institute has nine research offices for forests, forest climate, botany, soil resources, soil fertility, microbial ecology, microbial nitrogen fixation, farmland ecology, and pollution ecology. In addition, it has a public analysis laboratory, a printed intelligence and information office, and a tree park. It has six field stations in different natural regions at Changbai Shan in Jilin Province and in Heilongjiang, Nei Monggol, Hunan, Liaoning, and other areas (the Changbai Shan Natural Protection Area is part of the United Nations Man and Biosphere Project). It has a total of 586 employees including 41 advanced research personnel and 232 middle-level research personnel. It has more than 270,000 plant specimens, more than 10,000 each of soil samples and insect specimens, and more than 3,000 types of microbes and bacteria.

The institute is based on the four fields of forestry, soil microbiology, soils of the northeast, and plants of the northeast, and its research orientation is toward continental ecosystems with an emphasis on forest ecology and the corresponding study of farmland ecology, pollution ecology, and other marginal disciplines.

The institute has carried out a great deal of R&D over the past 30 years in the areas of comprehensive natural resource utilization, forest cutting and renewal, sand stabilization for afforestation and farmland shelter forests, the formation and improvement of saline-alkaline soils in the northeast, biological nitrogen fixation (autogenic, symbiotic, and chemical-modeling nitrogen fixation and nonleguminous tree nitrogen fixation), regional ecological and environmental evaluations and comprehensive control, and other areas. It has made a total of 165 scientific research achievements, including 52 major achievements and 53 that have received awards. It has edited and published more than 30 works including HONGSONG LIN [KOREAN PINE FORESTS], DONGBEI LUOYE SONGLIN [DECIDUOUS AND PINE FORESTS OF THE NORTHEAST], NONGTIAN FANGHULIN XUE [THE STUDY OF FARMLAND SHELTER FORESTS], DONGBEI CAO BEN ZHIWU ZHI [HERBACEOUS PLANTS OF THE NORTHEAST], DONGBEI XIANLEI ZHIWU ZHI [MOSSY PLANTS OF THE NORTHEAST], ZHONGGUO DONGBEI TURANG [SOILS OF NORTHEASTERN CHINA], TURANG WEISHENGWU FENXI FANGFA SHOUCE [HANDBOOK OF ANALYTICAL METHODS USED IN SOIL MICROBIOLOGY], and others.

Director: Gao Zhengmin [7559 2163 3046]

Party secretary: Zhang Wen [1728 2429]

Academic Committee chairman: Zeng Zhaoshun [2582 2507 7311]

Address: No 6, Section 2, Wenhualu, Shenhe District, Shenyang

Telex: 0960

Telephone: 482313

Shenyang Institute of Automation

Preparations for construction of the Shenyang Institute of Automation began in 1958. It was given the name of the CAS Liaoning Branch Institute of Automation in 1960. It was formally named the CAS Shenyang Institute of Automation in 1972 and focuses on research on controller systems in combination with research on information processing systems and control theory and applications. It was decided in 1979 to make its primary scientific orientation intelligence systems, modern control engineering, pattern recognition, and information processing. It currently has 721 employees, including 379 S&T personnel and 39 specialists in other areas (food service, translation, editing, medicine, accounting, etc.).

The institute has nine research offices and one auxiliary factory. The research offices are: The Policy-Making and Control Office, the Control Engineering Office, the Television Image Processing Office, the Pattern Recognition Office, the Machine Intelligence Office, the Computer Resources Development and Application Office, the Intelligence and Information Office, the New Technical Applications Office, and the Machine, Optics, and Sensor Office.

During the 1960's and 1970's, the institute successfully developed continuous automatic dry point, flash point, viscosity, and other analyzers for the YJ-1 controller, a color mass spectrometer analyzer used with computers, an automated management system for oil depots, character and graphic display equipment, automatic control equipment for cloud chambers at cosmic ray observatories, automated envelope sorters, remote control equipment for television broadcast relay stations in high mountains, and other achievements.

Since deciding upon its disciplinary orientation in 1979, the institute has made several achievements that are at advanced levels in China in the areas of modern control engineering in intelligence systems, pattern recognition, and information processing.

In 1978, it was entrusted by the China Automation Society with creating the scholarly journal XINXI YU KONGZHI [INFORMATION AND CONTROL] and the magazine GUOWAI ZIDONGHUA [FOREIGN AUTOMATION].

Director: Jiang Xinsong [5592 2450 2646]

Party secretary: Chang Yi [1603 3015]

Academic Committee chairman: Jiang Xinsong

Address: Sanhao Street, Heping District, Shenyang

Telex: 1170

Telephone: 482994; 482942

Shenyang Institute of Computing Technology

The Shenyang Institute of Computing Technology was formed in 1962 by combining the Liaoning Institute of Computing Technology (at Shenyang) and the Jilin Institute of Digital Computing and Mathematics and was given the name of the CAS Northeast Computing Center. Its name was changed to the CAS Shenyang Institute of Computing Technology in 1970. It now has 570 employees, including 331 S&T personnel (9 advanced research personnel and 210 middle-level personnel).

The institute is engaged mainly in applied research on small and microcomputer systems and their applications, research on computer system software and application software, and research on computer mathematics theory and methods.

In the more than 20 years since its establishment, the institute has successfully developed a total of 25 electronic computers from 3 generations (tubes, transistors, and integrated circuits), and 3 scales (medium, small, and micro). It has done more than 200 enormous engineering calculating projects for the national economy and national defense construction, and it has made nearly 100 scientific research achievements. Nine achievements have received national awards, eight have received CAS awards, two have received Liaoning Province awards, and two have received Shenyang City awards. In addition, the institute has edited and translated 20 useful books and written more than 200 articles and reports.

Director: Jiang Shifei [5592 1102] (concurrent)

Party secretary: [blank]

Academic Committee chairman: Jiang Shifei

Address: No 20, Section 2, South Sanhao Street, Shenyang

Telex: 0012

Telephone: 482012

Metal Corrosion and Protection

Corrosion of metal is a serious problem in industrial production. According to statistics, the amount of iron and steel equipment that must be discarded each year in the United States and the Soviet Union because of corrosion accounts for one-third of yearly steel output, and the world as a whole loses more than 100 million tons of metal each year from the resulting destruction. Moreover, losses in accidents attributable to corrosion often are much greater than the direct losses due to corrosion of the metal itself. The CAS has done a great deal of research concerning metal corrosion and protection, including surface corrosion prevention technologies and techniques, various types of corrosion reducers and coatings, etc., that have made contributions to metal corrosion prevention work.

Shenyang Scientific Instruments Factory

The Shenyang Scientific Instruments Factory was built in 1958. At the time, it was called Factory 512 and was a machine processing factory under the CAS. Later, it was transferred to the National Defense Science Commission. It was returned to the CAS in 1970. It currently has 512 employees, including more than 90 engineering and technical personnel at the engineer level and above. It has three research offices, two major topic groups, three production workshops, and one auxiliary workshop that have permitted the preliminary formation of a development and design capacity for surface instruments and equipment and the production capacity for precision machine processing.

Since the 1970's, the factory has come to have a clear foundation in vacuum and an orientation toward surface analysis instruments. The management principle of the factory has been one of a comprehensive scientific research and production entity with continually improving economic results. Moreover, it has engaged in broadranging and successful cooperation with various research institutes and institutions of higher education for joint responsibility in developing and producing small amounts of electron-beam extension equipment, X-ray electron spectrometers, Auger electron spectrometers, field-ion microscopes, high-energy electron diffractometers, low-energy electron diffractometers, beginning potential spectrum and ion thinning equipment, vacuum ion coaters, oiled ultrahigh vacuum units, oil-less ultrahigh vacuum units, etc.

Manager: [blank]

Party secretary: [blank]

Technical Committee chairman: Sun Dazhong [1327 1129 2973]

Address: No 18, Section 2, Sanhao Street, Heping District, Shenyang

Telex: 1172

Telephone: 482436

Rapid Electroplating Fluids

A rapid electroplating fluid successfully developed by the CAS Shanghai Institute of Organic Chemistry can restore wear and processing deviations in machinery parts and components, and it can be used in the electronics industry for printed circuits. This new technology is convenient and flexible. It does not use conventional electroplating tanks but instead uses a brush for plating with the rapid electroplating fluid to form a layer of metallic plating on the workpiece. It is being widely used in the aviation, navigation, metallurgical, machine, and electronics, and other industries and sectors, with enormous economic benefits. In the past, repairs of the landing gear of Boeing 707 civilian aircraft, for example, took 2 months to complete. By using this type of electroplating fluid, however, the aircraft do not have to be taken off the field and the job can be done in 2 days. Costs are only one one-thousandth of what they were in the past.

Metal Corrosion and Protection Institute

The Metal Corrosion and Protection Institute is a specialized research institute that was organized on the basis of the High Temperature Oxidation and Protection Research Office in the [Shenyang] Institute of Metals and the Metal Corrosion and Protection Research Office and other offices of the Institute of Applied Chemistry. It was established formally in Shenyang on 1 December 1982. It now has almost 100 employees, and has established 4 research offices and 3 research groups. Its full completion is planned for 1986, when the total number of personnel will reach 250, with two-thirds of them being S&T personnel. It will have a total of 10 research offices and technical offices that will be engaged primarily in research work in the areas of corrosion electronics, high-temperature oxidation, thermal corrosion, corrosion slowing agents, stress corrosion and corrosion fatigue, metal surface protection, soil, atmospheric, and seawater corrosion, and other areas.

The institute has rather advanced experimental equipment as well as accomplished scholarly leadership and an S&T backbone force in the areas of corrosion electrochemistry, high-temperature oxidation and protection, corrosion-slowing agents, stress corrosion, and other fields that has solved corrosion problems and provided theoretical foundations for national defense, the chemical industry, petroleum development, energy resource utilization, and other areas.

The institute has grown into a developmental research unit that has adequate complements of experimental equipment and living facilities to provide a research base area and research expenditures when needed to instructors in institutions of higher education, graduate students, engineering and technical personnel in industrial enterprises, and Chinese and foreign scholars so as to promote and strengthen technical exchanges and development in its field.

Director: Shi Changxu [1597 2490 4872] (concurrent)

Party secretary: [blank]

Temporary Academic Committee chairman: Shi Changxu

Address: No 6, Section 2, Wenhualu, Shenyang

Telex: 2170

Telephone: 483115; 483116

Xi'an Branch, Chinese Academy of Sciences

The Xi'an Branch was established in 1978. The organs it administers at present are: the Xi'an Institute of Optics and Fine Mechanics, the Xi'an Observatory, the Northwest Institute of Soil and Water Conservation, Department 2 of the Qinghai Institute of Saline Lakes (as administrative agent), and the Loess and Quaternary Research Office. It currently has a total of 2,839 employees including 1,350 S&T personnel.

The organs of the branch include an Office, a Political Office, a Personnel Office, an Education and Foreign Affairs Office, a Conditions Office, a Foreign Language Training Office, a Research Coordination Office, a Planning Office, and other professional organizations.

Director: Li Zhensheng [2621 2182 5116]

Party secretary: Yang Wenjing [2799 2429 2529]

Address: 3 East Xiaosailu, Xi'an, Shaanxi

Telex: 1355

Telephone: 53966

Xi'an Institute of Optics and Fine Mechanics

The Xi'an Institute of Optics and Fine Mechanics was established in 1962 and was formed from some of the personnel from the CAS Xi'an Institute of Atomic Energy, the Shaanxi Institute of Applied Optics, and the Automation Institute of the Institute of Machinery. It now has 12 research offices and 1 subsidiary factory. It has 1,076 employees including 477 S&T personnel. The disciplinary orientation of the institute is on high-speed photography and optics and it is engaged mainly in applied research concerning high-speed photography, photoelectric imaging components, fiber optics, variable refractivity optics, optical information processing, and other areas.

Since its establishment, the institute has successfully developed various types of high-speed photography instruments and equipment, image converter tubes, fiber optics components, zoom television camera lenses, and other products, including major ones like high-speed movie transits, changeable lens scanning high-speed cameras, television-imaging converter tube high-speed cameras, prismatic compensating high-speed cameras, heat chamber periscopes, etc. In 1983, the institute successfully developed a picosecond image converter tube scanning high-speed camera that filled in a blank in China.

Honorary director: Gong Zutong [7859 4371 0681]

Director: Bi Mingqin [5643 7686 3808]

Acting party secretary: Jiang Changgui [1203 7022 6311]

Academic Committee chairman: Gong Zutong

Address: 74 West Friendship Road, Xi'an

Telex: 1080

Telephone: 51376

Silicate Materials

Silicate materials refer to materials containing the element silicon, like bricks, cement, window glass, and household ceramics, but a large number of new inorganic materials that contain no silicon also are called silicate materials by tradition. The CAS Institute of Silicates has had many achievements in this field and has made enormous contributions to the development of materials science in China by solving a large number of questions in national defense engineering and providing civilian products like selection of optimum insulation materials and development of acid and alkaline resistant low-temperature resistant enamels, optical waveguide fibers, etc.

Xi'an Observatory

The Xi'an Observatory was established in 1966. In the beginning, there was only a shortwave time service station, and a longwave time service station was added in 1973. The observatory formally became China's standard time and frequency broadcast station on 1 July 1981. It now has 707 employees including 298 S&T personnel (125 in middle-level positions and above).

The observatory is involved primarily in observations of celestial bodies and research on time and frequency and their applications. It is China's time service center. The main work tasks include establishing atomic time references for China, utilizing longwave and shortwave radio stations to broadcast standard time and frequency signals, and developing applied research in basic astronomy, new technologies for time synchronization, time and frequency signal transmission, solar-terrestrial relationships, and satellite observations.

The observatory's more representative scientific research achievements since its founding are: research and application of a time service right ascension star chart for China, world time measurements and longwave time service systems, establishment of atomic time benchmarks, BPM standard time and frequency broadcasts, design experiments and studies of longwave time service technologies, etc.

Director: Miao Yongrui [25379 3057 3843]

Party secretary: Wang Zhicai [3769 3112 2088]

Academic Committee chairman: Miao Yongrui

Address: Lintong County, Xi'an

Telex: 1131

Telephone: Xi'an 32255

Address of Department 2: Pucheng County, Shaanxi

Telex: Pucheng County 4430

Telephone: Pucheng central switchboard

Insulating Technologies for Pipes in Heat Grids

Heat grid pipe insulating technologies successfully developed by the CAS Institute of Mechanics, Institute of Silicates and Institute of Technical Physics have an insulating efficiency of 96.9 percent, which is near advanced international levels. The Yanshan Petrochemical Plant transformed 13 km of heat grids in 1984, which saved several 1,000 tons of oil and provided economic benefits worth millions of yuan. This is a low cost and highly effective energy conserving technology.

Northwest Institute of Soil and Water Conservation

The Northwest Institute of Soil and Water Conservation was established in 1956 and was organized on the foundation of the Northwest Work Station on the CAS Beijing Institute of Botany and the Loess Experiment Station of the Nanjing Institute of Pedology. Its original name was the Northwest Institute of Agriculture and Biology, and it was transferred down to Shaanxi Province in 1970. The institute was returned to the CAS in 1979 and renamed the Northwest Institute of Soil and Water Conservation. It now has 328 employees including 217 S&T personnel (19 advanced personnel and 101 middle-level personnel). It has eight research offices for land utilization, soil erosion, soil geography, soil fertility, forest and grassland ecology, crop ecology, isotope applications, and information, and it also has a technical office.

During the early period after the institute was established, it focused on questions of soil and water conservation in the middle reaches of the Huang He, and developed research in biology, agriculture, forestry, animal husbandry, aquaculture, and other areas. Its orientation and tasks underwent several changes after 1958, and it was decided in 1979 to orient toward the loess plateaus in the middle reaches of the Huang He with a focus on soil and water conservation. It developed research on laws of soil and water loss and means of prevention, evaluation, and rational utilization of soil and land resources, data and techniques for restoring vegetation, systems and means to increase yields in dry-crop agriculture, and other areas.

The institute during its early days was involved mainly in comprehensive soil and water conservation surveys in the middle reaches of the Huang He and it completed a series of reports and special works in agriculture, pedology, botany, soil and water conservation, and other areas. Later, it developed research in areas like biology, pedology soil and water conservation and various other fields, and made more than 100 achievements. The more prominent ones are: research on laws of soil erosion in loess regions, soil erosion classification systems and national soil erosion classification charts, and zoning of soil erosion in the middle and upper reaches of the Chang Jiang; research on terraced fields in plateau areas; analysis of silt sources in small drainage basins; research on 1:1,000,000 loess plateau soil maps, basic qualities of soils, soil water, and low-quota irrigation, initial soil formation processes, etc.

Honorary director: Zhu Xianmo [2612 7359 6206]

Director: Yang Wenzhi [2799 2429 3112]

Party secretary: Wan Weirui [8001 3634 3843]

Academic Committee Chairman: Zhu Xianmo

Address: Yangling District, Xianyang, Shaanxi

Telex: Yangling 3932

Telephone: [blank]

Fujian Institute on the Structure of Matter

The predecessor of the Fujian Institute on the Structure of Matter was the Fujian Province Institute of Technical Physics, established in 1960. In 1961, the Institute of Technical Physics was combined with the Institutes of Applied Chemistry, Electronics, Mathematics and Mechanics, Automation and Rare Metals, the Biology Research Office, and other units, and placed under the jurisdiction of the CAS Fujian Branch. It underwent several changes later and was renamed the CAS Fujian Institute on the Structures of Matter in 1973. It currently has 550 employees including 311 S&T personnel (2 researchers, 9 assistant researchers, 2 advanced engineers, 116 research assistants, and 63 engineers).

It has four structural chemistry research offices, four materials research offices, and research offices for analytical chemistry, complex catalysis, and printed information, an electronic computer station, and a seawater corrosion experiment station in Xiamen.

This institute is engaged mainly in research on the microstructure of matter and its interrelationship with macro performance, with transitional metal atomic cluster compounds and new technical crystalline materials as the research targets. It also does the corresponding research concerning quantum chemistry as well as structural determinations for large biomolecules, complex catalysis, and metallic corrosion and protection. The institute has had definite success in structural chemistry, complex catalysis, electro-optical and nonlinear optical crystals, X-ray spectroscopic crystals, laser crystal materials and technologies, metallic corrosion and protection, and other areas, and it has made more than 120 S&T achievements. The more obvious ones include simulation research on active cores of nitrogen fixing enzymes, provision of "Fuzhou Models I and II", and heuristic synthesis of simulations; theories on reaction ion base groups in nonlinear optical crystals and explorations of new materials; research on yttrium aluminic acid (YAP), laser crystals, and high-power continuous lasers; research on improvements in the use of the (Leihu) method carbonyl synthesis of butanol catalysis, etc.

Honorary director: Lu Jiaxi [4151 0857 6932]

Director: Liang Jingkui [2733 2417 7608]

Party secretary: Zhuang Mu [8369 3665]

Academic Committee chairman: Lu Jiaxi (concurrent)

Address: Xihe, Fuzhou

Telex: 8093

Telephone: 54946

Oceanography Institute

The predecessor of the Oceanography Institute was the Qingdao Institute of Marine Biology in the Institute of Aquatic Biology. It was established in August 1950 and became an independent research institute in January 1954. It was expanded into the Institute of Marine Biology in 1957 and grew into a comprehensive oceanography institute in January 1959.

The institute now has more than 600 S&T personnel including 78 advanced research and technical personnel. It has a total of eight research offices as well as a printed information office, a central laboratory, an auxiliary factory, a marine biology raising building, the Yantai and Zhoushan work stations, the Huangdao experimental fish and shrimp breeding farm, and 3,000-ton, 1,000-ton, and 700-ton marine survey vessels, and two coastal workshops. The China Oceanology and Limnology Society also is located in the institute.

The scientific research orientation and tasks of the institute are: to carry out comprehensive survey research of the marine environment and resources of the continental shelf in Chinese seas, especially research concerning development and utilization of organic oil and gas and other resources, and to take action to develop comprehensive surveys of nearby oceans. Four projects have been the focus in recent years: 1) research on agro-pastoralization of marine aquatic production, especially research on breeding and cultivation biology and methods for major fish, shrimp, shellfish, and algae, as well as research in increased breeding of fish and shrimp resources; 2) research on circulation structures in the Yellow Sea and East China Sea (including kuro-shio), sea-atmosphere interactions, and the effects of the oceans on climate, with an emphasis on research concerning hydrological, climatic, and mechanics questions in oil and gas exploitation in the Yellow Sea; 3) research on the geological characteristics and forecasts of the oil-bearing prospects of the continental shelf of the Yellow Sea and East China Sea and the Okinawa Trench, with a focus on research concerning geological questions related to the development of oil and gas in the Bohai Sea and Yellow sea; 4) research on environmental pollution and protection of the sea at river mouths and offshore areas.

The institute has made 267 important achievements since it was founded, including 47 projects that have received national, regional, and CAS major achievement awards. It has prepared more than 1,600 articles and more than 60 special works. It has completed research tasks in several comprehensive oceanic surveys and surveys of fishery resources, offshore marine currents, water masses, tides and waves, nutritional salts, chemical factors and sources of pollution, seabottom terrain, sedimentation and structures, silt reaccumulation trends, marine plant and animal taxonomy, distribution, regional systems, numerical changes, ecological characteristics, the biology of important economic resources, and other areas, and gained a rather systematic understanding of all of them. At the same time, the institute has carried out experimental research in marine biology to gain an understanding of the physiological and ecological characteristics of several marine animals and plants, and it has provided artificial breeding, fry, and seedling raising and cultivation and breeding methods for several important cultivation and

breeding targets (like kelp, laver, prawns, redeye mullet, flounder, mussels, scallops, abalone, etc). It also has provided effective measures for preventing and eliminating certain harmful organisms that adhere to boats and pipes, as well as for seawater corrosion and protection of metals, comprehensive utilization of marine algae, and other areas of research, and made an obvious contribution to national economic construction.

Honorary director: Zeng Chengkui [2582 0701 1145]

Director: Liu Ruiyu [0491 3843 3768]

Party secretary: Qin Yunshan [4440 5686 2694]

Academic Committee chairman: Liu Ruiyu

Address: 7 Nanhailu, Qingdao

Telex: 3152

Telephone: 86882

Shanxi Institute of Coal Chemistry

The predecessor of the Shanxi Institute of Coal Chemistry was the Coal Research Office of the Dalian Institute of Chemistry and Physics, established in 1954. It moved to Taiyuan in 1961 and was named the Institute of Coal Chemistry. It was returned to the CAS in 1978. It currently has 771 employees including 35 advanced researchers and 256 middle-level S&T personnel. It has six research offices: the Coal Gasification and Indirect Liquefaction Technology Development Office, the Chemical Engineering Office, the Coal Chemistry Office, the Catalysis Office, the Physiochemical Analysis Office, and the Carbon Materials Office. It has three technical service departments: the Printed Information Office, the Technical Facilities Department, and the Advisory Services Department.

Since its founding, the institute has been involved in basic research on coal classification, coal used in coking, dry distillation of coal, and the relevant areas of coal chemistry and coal lithology, basic research on basic organic synthesis of coal and petroleum, and other topics. After 1978, its main activities shifted to coal energy conversion with a focus on the development of new technologies for coal gasification and liquefaction (including indirect and direct liquefaction) and exploration of the related basic questions in catalysis, chemical engineering, the structural chemistry of coal and carbon, etc.

The institute has made 161 scientific research achievements, the more important ones including: classification of Chinese coking coal; the utilization of high volatility bituminous coal and rational coal crushing in coal used for coking; the structure and qualities of microcomponents in coal and rock; the composition and utilization of humic acid; high efficiency gas purification catalysts; hydrogenation refining catalysts used for cracking gas, oil, benzene, naphthalene, and other substances, and manufacturing parabutylene diacid anhydride catalyst; fluidized-bed reactors, crude oil cracking techniques to make alkene and a technique for extracting arene from light diesel, five-fraction extraction of isoprene digifax from carbon and near-dimethylbenzene oxidation for manufacture of intermediate cresol gas and liquid reactor digifax; regulating and storage equipment for gas produced in rural areas, new types of carbon materials used in national defense, etc.

Honorary director: Peng Shaoyi [1756 1421 6654]

Director: Bao Hanchen [7637 3352 3819]

Party secretary: Lu Zaizheng [7627 0961 2398]

Academic Committee chairman: Peng Shaoyi

Address: South of East Yingzelu, Taiyuan, Shanxi

Telex: 3561

Telephone: 24345

Institute of Geochemistry

The Institute of Geochemistry was established in 1966 and was formed from portions of the CAS Institute of Geology and the CAS Guizho Institute of Chemistry as well as the Kunming Work Station of the CAS Institute of Geology. The institute currently has 717 employees, including 455 S&T personnel, and it has 12 offices and a subsidiary factory that are engaged in research in the areas of isotope and nuclear geochemistry, the chemistry of celestial bodies, sediments and organic geochemistry, ore seam geochemistry, elemental and regional geochemistry, experimental geochemistry, deep strata geochemistry, Quaternary and environmental geochemistry, mineral physics, mineral chemistry, mineral synthesis, crystalline mineralogy, basic mineralogy, rock and mineral analysis and testing methods, and other areas as well as instrument and equipment improvement and other work.

During its early period, the institute was engaged mainly in research on material composition, mineralization, and the laws of mineralization. The current orientation and tasks are to develop geochemistry and mineralogy, and it is involved mainly in theoretical research on mantle energy resources and mineralization of ore resources; basic research in the areas of geochemistry and mineralogy; research on Quaternary and environmental geochemistry, and other topics.

Since its establishment, the institute has carried out research on comprehensive utilization at five major symbiotic mines including Baiyunebo and Dachang as well as other important mineral product base areas. This has provided a scientific foundation for the prospects of greater reserves in these regions and for rational resource development. On the basis of a great deal of research concerning China's mineral resources including iron, platinum, nonferrous metals, rare elements, radioactive elements, etc., the institute has summarized the geochemical characteristics of special Chinese minerals and provided a multicausal theory of mineralization. It has studied the geochemical characteristics of granite in south China and the Xizang region and illustrated regularities in the formation and evolution of granite and its relationship to crustal movements. Oil and gas research in southwestern and eastern China, Xinjiang, and other regions has permitted the establishment of new organic geochemical indices and provided a model of petroleum evolution. Comprehensive multidisciplinary research has been carried out on Jilin meteoric rock and moon rocks and the geochemistry of deep strata rock and it proposed a formational and evolutionary model for Jilin meteoric rock. It has developed research on the thermal qualities of minerals, microwave electromagnetism, optical qualities, and other technical physics performance topics. In addition, it has established a time chart for Sinian geology and certain Quaternary time boundaries, and it has summarized the laws of loess accumulation and evolution in China and the relationship to paleoclimatic changes, and it has discovered 18 new types of minerals and their varieties in China.

Director: Tu Guangchi [3205 0342 3589]

Party secretary: Xie Xiande [6200 0341 1795]

Academic Committee chairman: Tu Guangzhi

Address: 67 Guanshuilu, Guiyang, Guizhou

Telex: 7181

Telephone: 24495

Shijiazhuang Institute of Agricultural Modernization

The Shijiazhuang Institute of Agricultural Modernization was established in July 1978 and originally was named the CAS Luancheng Institute of Agricultural Modernization. It was given its present name in August 1979.

The Shijiazhuang Institute of Agricultural Modernization is a comprehensive agricultural research organ of the CAS in north China and the central plains, and is under the dual leadership of the CAS and Hebei Province.

At present, this institute is engaged mainly in using Hebei Province's Luancheng County as a comprehensive scientific experiment base area for agricultural modernization to explore routes to achieve comprehensive utilization of modern S&T on a county scale to achieve Chinese-style agricultural modernization, to solve key scientific, technical, and economic problems and to explore routes for achieving agricultural modernization in the north China plains.

The institute has a total of 151 employees, including 84 advanced and middle-level scientific research and technical personnel. It has a Central Research Office, an Agricultural Economics Research Office, a Resource Survey and Utilization Research Office, a Livestock Research Office, a Forest and Pomology Research Office, and a Farm Machinery Applications Research Office, and it has two cropping research offices as well as an information office, chemistry laboratory, experiment station, and other professional organs. The experiment station has 417 mu of land.

Since its establishment, the institute has completed a comprehensive survey of agricultural natural resources and a rural economic survey of Luancheng County. In addition, the PGP zinc-plated steel pipe plastic sheds, dual stubble level broadcasting, and other research tasks have received widespread attention in China and abroad.

Director: Cao Zhendong [2580 2182 2639]

Party secretary: [blank]

Academic Committee chairman: Cao Zhendong

Address: East of Nanduanlu, Tiyu Dajie, Shijiazhuang

Telex: 6880

Telephone: 44361; 46521

Factory 713

Factory 713 was established in 1970 and originally was called the Xinxiang Branch Plant of the CAS Factory 109. It was established independently as a semiconductor components factory in October 1977 and named CAS Factory 713. It has a Production Office, a Technical Office, an Administrative Office, a CPC Committee Office, and a Factory Office. It has 419 employees including 60 engineering and technical personnel.

This factory developed and produced the large and medium sized TTL integrated circuits needed for the "757" project. With permission from the CAS, the factory imported technical equipment for liquid crystal display components from the United States and now has built a complete liquid crystal production line that has gone into large-scale production. To broaden the application of liquid crystal components, it established a circuit workshop in 1983 that mainly produces multifunction electronic clocks.

Besides these main products, the factory also produces far-infrared components in its far-infrared workshop. It now is involved in preparation for joint development of numerical display calipers.

Manager: Yu Dewen [0151 1795 2429]

Party secretary: [blank]

Address: Xinxiang, Henan

Telex: 0713

Telephone: 3283; 3284 (central switchboard)

Kaifeng Printing Plant

The predecessor of the CAS Kaifeng Printing Plant was the Kaifeng City Printing Plant. The name of the factory has changed several times. It was placed under the CAS in October 1978 and is a comprehensive middle-sized printing plant.

The plant area covers 12,778 m², including 7,320 m² of structures. It has 163 sets of primary equipment and has an annual capacity of 82.62 million flat printings, 17.136 million letter press printings, and 99.756 million small job printings. It had a total of 613 employees at the end of 1982.

The plant mainly prints books and periodicals, forms, matchboxes, and calendars. After being placed under the CAS, it practiced the principle of "service to scientific research and a focus on publishing CAS scientific research achievements" to guarantee the timely publication of S&T printed matter arranged by the CAS.

Improvements have been made in recent years in the area of product quality. In a comparison of printing quality with Henan Province in 1982, one product was named superior and five types of products were named first class. In a comparison of printing quality for middle and elementary school textbooks with eight provinces and municipalities, the plant received a certificate of award issued by the Publishing Industry Bureau of the Ministry of Culture.

Since its establishment, the plant has carried out more than 30 equipment and technique renewal projects. The plate printing workshop adopted new SO dry plate making techniques that greatly reduced the amount of time required for making plates.

Manager: Zhang Meixian [1728 2734 0341]

Party secretary: Wang Jiazhen [3769 1367 2823]

Address: 2 Wenmiao Street, Kaifeng, Henan

Telex: 4357

Telephone: 22395

An Advanced Butadiene Producing Catalyst

Butadiene is an important raw material in the manufacture of synthetic rubber that is extracted from butene by oxidation and dehydrogenation. China usually uses molybdenum series catalysts during the production process, but productivity is low and it causes serious pollution. The H-198 iron-system sharp crystalline catalyst developed successfully by the CAS Lanzhou Institute of Chemistry and Physics is very active, has good selectivity, is very strong, and has a long useful life. It has attained or surpassed advanced international levels in all primary main indices. Production at the Jingzhou No 6 Petroleum Refinery has proven that the use of H-198 catalyst improves quality, lowers costs, increases output, reduces pollution, and provides enormous economic benefits quickly.

Software Institute

The Software Institute is a research institute whose construction was approved by the State Science and Technology Commission in May 1984.

The primary orientation and tasks of the Software Institute are: to develop comprehensive research work in the computer sciences, software theory, software technologies, software tools, software engineering and applied software, to take responsibility for the state in development of software technologies, to work in conjunction with the relevant units in China and abroad for joint research on applied software packages and engage in other service-type work, and to train middle-level and advanced software personnel. In addition, the institute is an entity that serves as a research department of the China Software Technology Development Center and is responsible for determining research and development tasks.

Director: Xu Kongshi [6079 1313 2514]

Party secretary: [blank]

Address: Zhongguangcun, Beijing

Telephone: [blank]

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